

A Study of the Maxillae with Regard to Their Blood and Lymph Supply.

VI.

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We have seen the mandibular canal beset with foramina (Figs. 5, 72, 73, 83, 84, 85, 86); we have also noted that in places the roof of this canal was wanting (Figs. 54, 55, 56, 57, 71); this is especially well shown in the specimen of the developing tooth at 5 in Fig. 88 where the future contents of the mandibular canal (5) is continuous with the embryonal connective tissue, the so-called dental sac (7), which surrounds the tooth germ. When we examine the specimens in Figs. 135, 139, 140, 141, 142, we observed the blood vessels passing upward through the foramina in the roof of the mandibular canal to the roots of the teeth and the dental sac. Let us turn back and examine Fig. 90, where the roots of the teeth of the ox are exhibited, in which numerous foramina, not very well shown in this specimen, can be seen at different points. It is toward these many openings in the cementum that the blood vessel, etc., from the mandibular canal pass. There is no special single vessel for these teeth, but numerous vessels from the floor and the walls of the alveolus passed toward and

into the cementum. Usually, however, there is one opening larger than the rest, and into this a relatively large vessel passes.

The above condition in the tooth of the ox anticipates a similar, or almost similar, one in the human tooth; and the vascular relationship of the dental sac to the mandibular contents in the ox is the same as that in

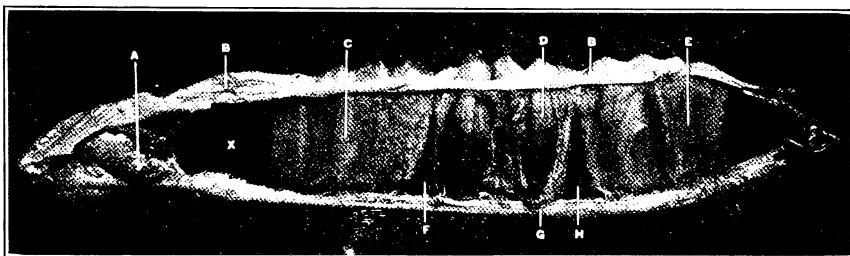


FIG. 143.



FIG. 144.

man, and probably most animals which have teeth. The anatomical and vascular relationship between this dental sac and the mandibular contents must be looked upon as almost fundamental in the study of the blood vascular and lymph vascular supply to the tooth.

We have presented to us in Figs. 143 and 144 a particularly interesting and beautiful specimen, for which we are indebted to Dr. W. J. Coates, Professor of Anatomy at the New York-American Veterinary College (Veterinary Department), of the New York University.

Fig. 143 gives us a profile view of the specimen, and Fig. 144 a view from below. The specimen was taken from the mandible of a fetal horse, and four teeth, or rather teeth with their dental sacs, are shown *in situ*. At A we have the first permanent molar, which has not as yet erupted. At C, D and E are to be seen the three temporary molars, which are about to penetrate the mucous membrane of the jaw. At B we

observe the mucous membrane, which covered the upper margin of the mandible. At C and E a portion of the dental sac still covers the teeth; in D the sac has been removed, exposing the tooth. At F and H are shown the position of the interalveolar septa; and G indicates the contents of the mandibular canal.

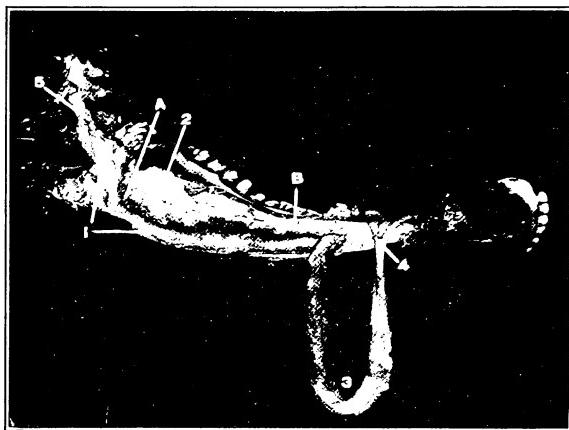


FIG. 145.

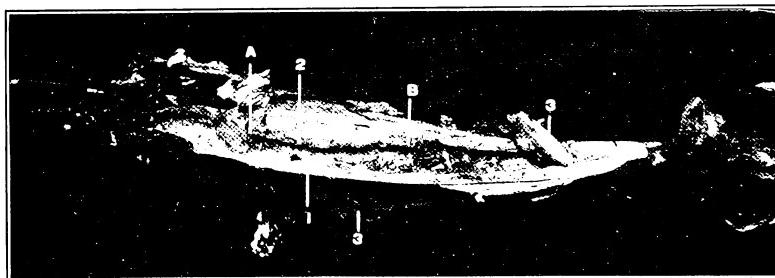


FIG. 146.

What makes this specimen so interesting is that it was enucleated, so to speak, in its entirety, from the mandible, at a time when the roof of the mandibular canal was not yet formed. The left end of the specimen, namely, the permanent tooth A, should be nearer C, thus making the space X an artefact, for the tissues above (the mucous membrane, etc.), and below (the contents of the mandibular canal!) were extensible, but not resilient, hence the space.

ITEMS OF INTEREST

Our attention is called in Fig. 144 to a view of the mandibular contents and its attachment to the tooth sacs, as seen obliquely from below. The left end of the specimen (at 1) shows the contents of the mandibular canal thinner than elsewhere, probably due to the manner in which this part of the specimen was removed from its bed in the mandible (possibly the traction).

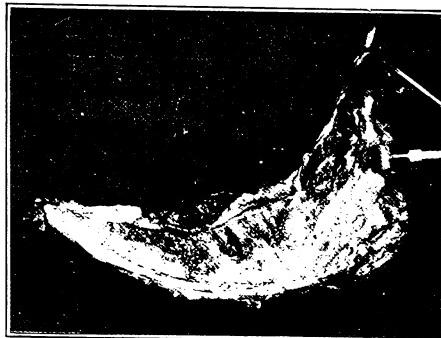


FIG. 147.

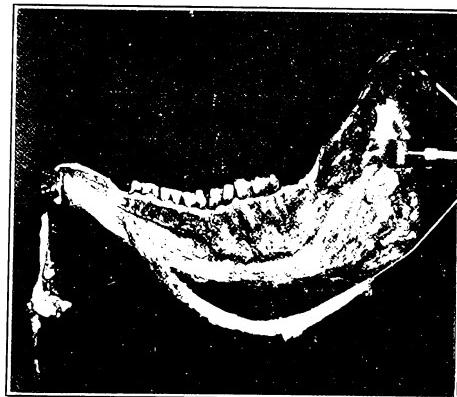


FIG. 148.

We present in Figs. 145 and 146 two views of a dissection of the left half of the mandible of an ox, and in Figs. 147, 148 and 149 three views of the right half of another mandible. In Fig. 145 we obtain an oblique view of the lower and inner aspect of the mandible; where 1 indicates the canal, 2 some fine cancellous bone, 3 the contents of the canal hanging on the end of the bone at 4; at which point (4) the

nerve artery and vein are seen, somewhat trident like, entering the mass of tissue, which has been removed from the canal. Imagine the tissue 3 in place in the canal 1, the trident at 4 would then occupy the point marked 5.

Fig. 146 is another view of the mandible looking toward the lower margin of the bone, which has been cut away. The contents of the man-

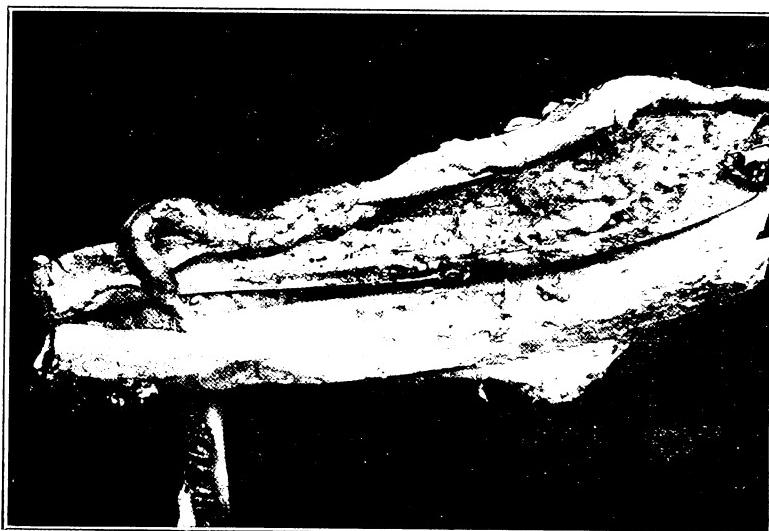


FIG. 149.

dibular canal (3) hang over the upper margin of the bone. The markings in Fig. 145 and 146 correspond. In Fig. 147 we obtain an inner lateral view of the right half of the mandible, the mucous membrane and periosteum have been dissected from the bone up to the margin of the alveoli for the teeth, and the two have been turned over upon the crowns of the teeth. We have likewise removed the cortex of bone, thereby exposing the roots of the teeth, the cancellous bone between and beneath them and the mandibular canal with its contents. In Fig. 148 we have cut the periosteum and mucous membrane away at the point where the mucous membrane of the gum, the periosteum of the cortex and the intra-alveolar periosteum meet, and it is seen hanging over the left end of the bone. The contents of the mandibular canal have been pulled out and are supported by a piece of cord.

ITEMS OF INTEREST

In order that we may have a better idea of this bone we must re-examine Fig. 5 (Article I) and Fig. 91 (Article III). The former gives us a picture of the under side of the specimen seen in Figs. 145 and 146, between the points marked A and B, after the fat, etc., have been removed



FIG. 150.

from the bone, thereby showing us the delicate cancellous bone and the numerous foramina in the mandibular canal. The latter shows us the same bone as seen from above.

A larger and better picture of this tissue, prior to the removal of the soft parts, is demonstrated in Fig. 149. The specimen was taken from the left side of the jaw, and the view is from below, where the roof of

the canal (the lower part of the specimen) appears compact, only a few shreds of tissue (blood vessels, etc.) are seen clinging to the bone. The fat and the cancellous bone are seen above the canal, and lying upon the top of the specimen are the contents of the canal.

Let us take a section of the contents of the mandibular canal and examine it under the microscope with a low-power lense; then we will

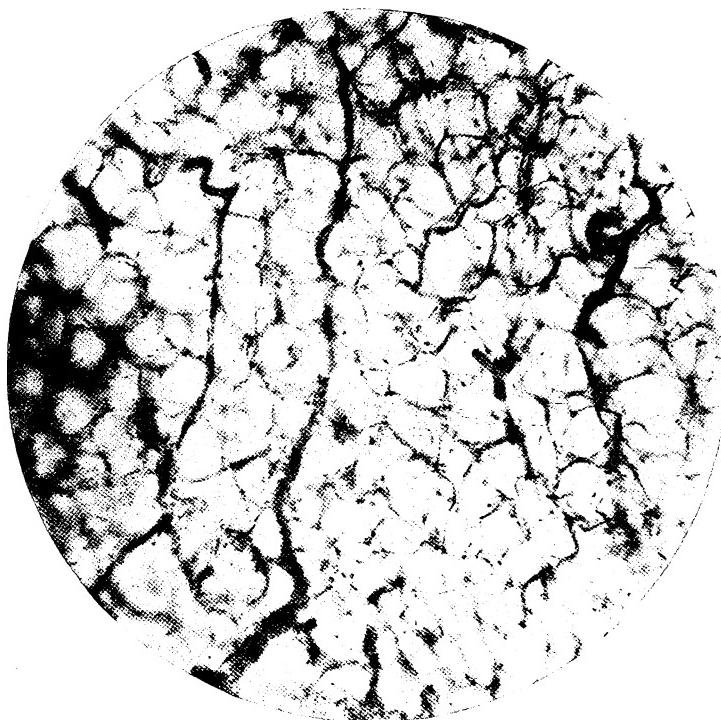


FIG. 151.

have the picture shown to us in Fig. 150. The tissue is a mass of fat (yellow marrow) in which we see, in the upper part of the specimen, a large vein with a branch leaving it, at its left side. To the left, and below this vessel, we observe two other vessels, with walls relatively greater in thickness than those of the two veins; they are arteries, the smaller one is an oblique section of one of the branches of the larger one. To the right of the artery is to be noted a nerve trunk, consisting of twelve fasciculi; while here and there throughout the mass, and espe-

cially well seen at the periphery, are numerous small vessels. A part of the so-called endosteum is shown along the edge of the specimen, the rest of it remained fastened to the bone in the canal, as shown in Fig. 149. This setting of inferior dental artery, vein and nerve in a mass of marrow

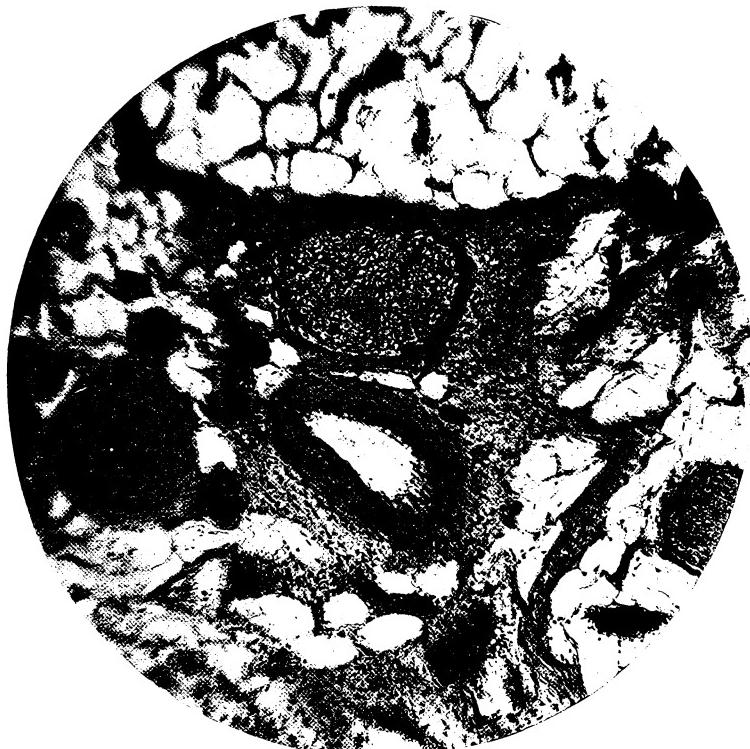


FIG. 152.

fat and connective tissue seems to be characteristic, and is found, as such, in all mandibles examined by me; of course, the amount of fat varies in different specimens, in different animals, and at different periods of their growth. Fig. 150 was stained with picric acid-fuchsin. (Van Giesen.)

We look, in Fig. 151, at a section of this marrow viewed by a No. 5 Leitz objective. In this field are shown numerous arterioles, venules and capillaries, lying among the oval and rounded areas, which are fat cells. This specimen was stained with hematoxylin and eosin.

Stained in a manner similar to the specimen in Fig. 151, Fig. 152 shows us a section of this tissue taken from the edge of the same—the endosteum—in which we find, at the center of the specimen and above, a nerve bundle; immediately below this and toward the left are seen two



FIG. 153.

small blood vessels, the one at the left contains blood. At the margin of the field, to the right of these two vessels, a part of another nerve bundle is to be observed; and scattered throughout the field, in the fibrous connective tissue and fat, are seen, in transverse and longitudinal section, many other smaller vessels, also containing blood. Especially worthy of our attention is the nerve bundle in the upper part of the specimen, which is seen lying in a mass of fibrous connective tissue, surrounded by a sheath of the same, the perineurium, from which, in turn, fine trabeculae of the same tissue enter the bundle, forming the endoneurium, which surround each individual so-called nerve fiber. Within



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the endoneurium is to be noted a white area, at the center of which is a black spot. The white area is the medullary substance or white substance of Schwann, and the black dot is what we formally called the nerve fiber; to-day we call it the axon of an efferent neuron (possibly

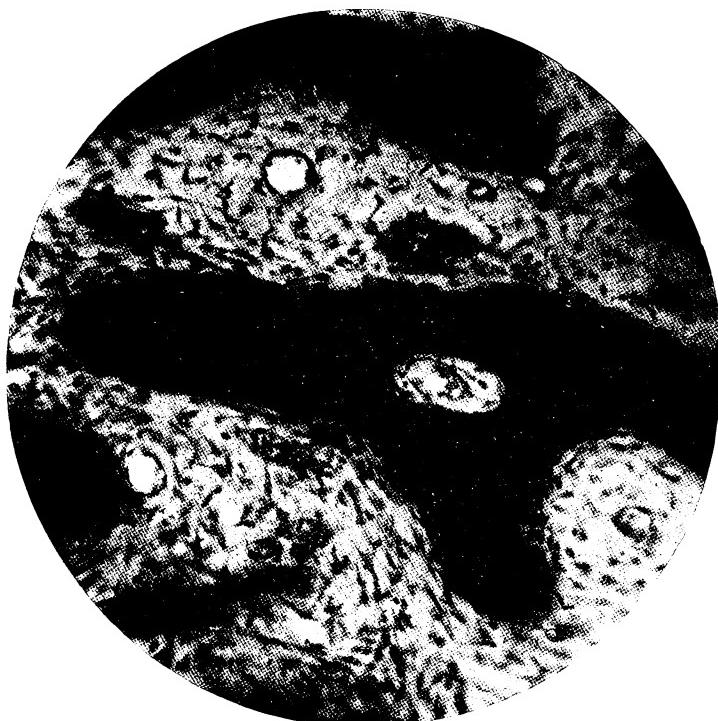


FIG. 154.

a motor fiber), or dendron of an afferent neuron (possibly a sensory fiber), or we might speak of the fibers as centrifugal processes of efferent or afferent neurons.

The appearance of these medullated nerve fibers, when seen in transverse section, and their micro-chemical reaction to certain staining agents, also the reaction of the connective tissue (endoneurium) which surrounds them, brings up in a most forcible manner a comparison between the three, *viz.*, nerve fiber, sheath of Schwann and endoneurium, and three other structures met within the tooth, *viz.*, Tomes' fiber sheath of Neumann and dentin.

We had shown to us in Fig. 151 the kind of tissue which occupied the interior of the bone. The recognition of the extreme vascularity of this tissue is of interest, not only to the histologist, but of great practical importance to the clinician. Let us keep this picture in mind and con-



FIG. 155.

trast it with Fig. 153, which is a section of the alveolar wall seen in Fig. 88, Article III, which showed the developing jaw and tooth. At the left of the picture (A) we see some blood vessels, lying in embryonal connective tissue, which corresponds with our future periosteum; at the right side (B) we see a portion of the future tooth sac; and between A and B we are shown the developing bone for the cortex, alveolar wall and the cancellous bone of the alveolar process; in which developing bone, between the apparent island of young bone, joining the dental sac with the

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forming outer periosteum of the bone, we see embryonal connective tissue, in which a number of forming blood vessels are already present. The osteoblasts are particularly evident at the periphery of the forming bone. At this time, at any rate, we observe how easy it is for a vascular

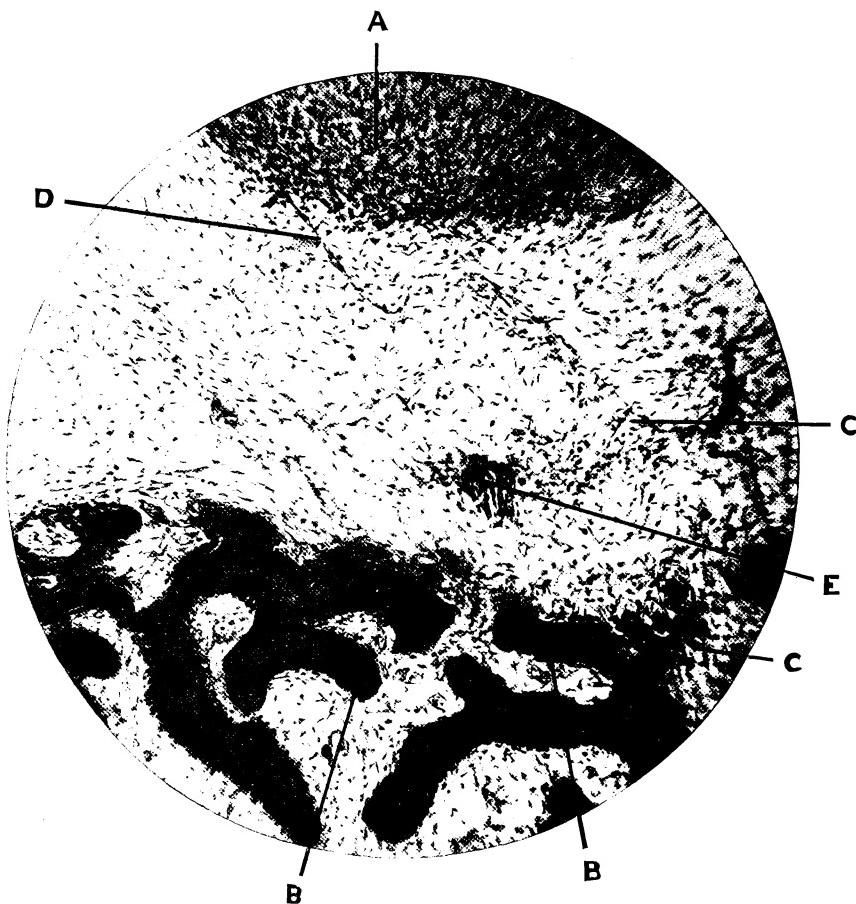


FIG. 156.

communication to exist between the outside of the alveolus and the contents of the alveolus. At C is a budding capillary, still better shown in Fig. 157.

In Fig. 154 we view a still higher power picture of this developing

bone, showing a number of blood vessels, both within the bone and in the tissue between the trabeculae of bone, the walls of which are seen in transverse section and made up of a single layer of endothelium, the nuclei of the cells are seen bulging into the lumen of the vessel.

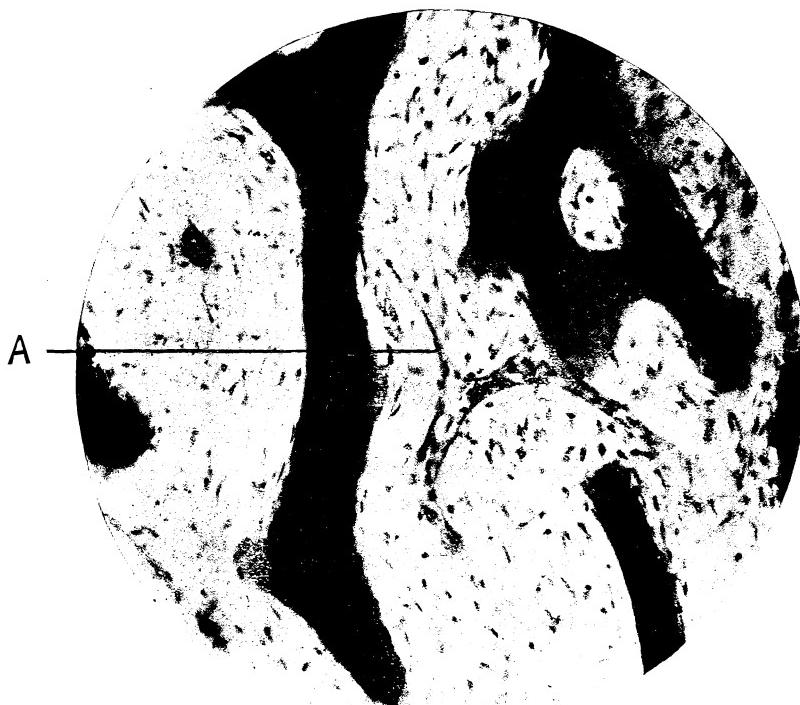


FIG. 157.

In Fig. 155 we look at another picture of this young bone, where the osteoblasts are seen at the edges of the bony masses; in many places young bone cells are seen lying in their proper lacunæ. The embryonal connective tissue is well shown lying in the bony meshes; and a blood vessel whose wall is made up of a single layer of cells is seen passing obliquely across the field. Figs. 154 and 155 were taken with lenses of a higher power than Fig. 151. In Fig. 155 we are looking through the wall of the vessel, which is transparent, and the stained oval nuclei of the

endothelial cells are seen scattered over the wall, in and partly out of focus.

Let us examine for a while the tissue lying between the future floor of the alveolus and the dentinal papilla. This tissue, the precursor of the dental sac, is shown us in Fig. 156, and lies between A, the base of the



FIG. 158.

dental papilla, which is a dense kind of embryonal connective tissue, and B a part of the developing bone of the alveolus. Compare this picture with Fig. 88 at the bottom of the forming alveolus. In the dental sac, in Fig. 156, the wall of a large vessel in longitudinal section is seen toward the right half of the specimen at C. In the upper left quadrant of the field at D, a budding capillary is shown, while at E a larger vessel with its muscle coat is partly formed. The type of tissue here shown is

precisely the same as that shown in the meshes of the developing bone, seen in Figs. 153, 154, 155.

At the point C in Fig. 153, and better still at A in Fig. 157, we have a budding process of a capillary. It is held by some that protoplasmic sprouts branch off from the already developed capillaries, which extend into the surrounding tissue. These sprouts are formed by mitotic di-

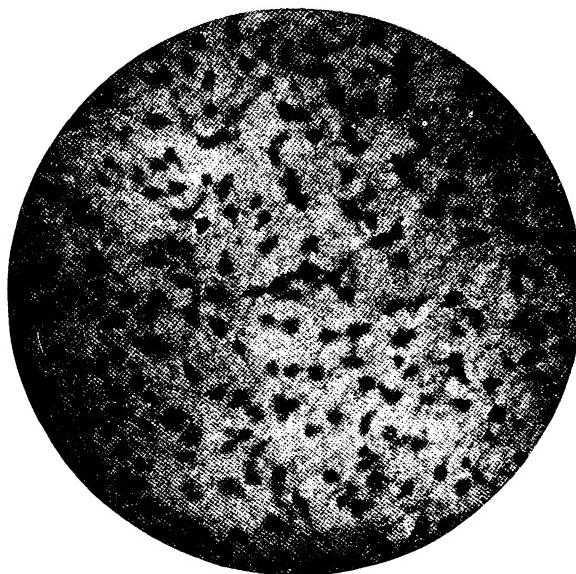


FIG. 159.

vision of the endothelial cells. The buds form blind canals which become hollow; they run to other buds and join them and the lumen of the two becomes continuous.

Ranvier and others hold that there are vaso-formative cells which independently form the capillaries, and that these vessels do not arise from pre-existing capillaries.

The continuity of soft tissue between the dental sac and the outside of the jaw is very conspicuous in the embryo, and in the adult jaw the same condition must persist to a limited degree.

Blood vessels in the embryo run through this tissue and are continuous with those on either side of the new forming alveolar process. If these conditions exist during development, why does not the condi-

tion persist, either in its entirety or in a modified form in the adult, the need is as great in the fully formed state as in the developmental one? The result of study of the process of differentiation and future maintenance of the alveolus, intra-alveolar periosteum, and cementum and pos-

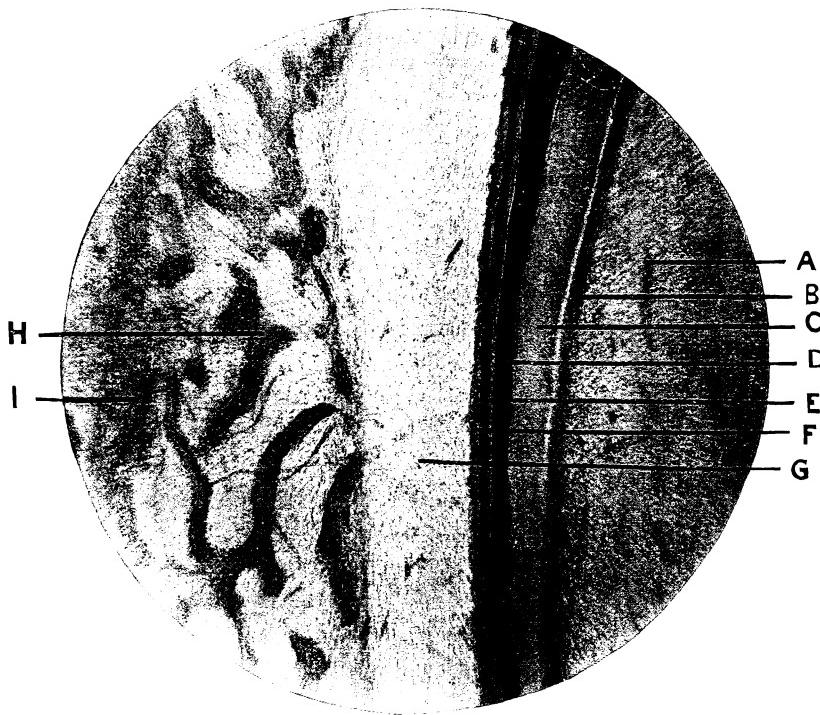


FIG. 160.

sibly the other structures of the tooth, tend to answer the above query.

Our last three pictures offer us some most interesting and profound problems in the cytology, embryology and physiology of structures in and about the oral cavity. In Fig. 158 we examine a section of the oral (A) and nasal (B) cavities, which are separated by a palate which is made up almost entirely of embryonal connective tissue. The epithelium of the oral cavity is continuous, in the median line C, with that of the nasal cavity. The cartilaginous septum of the nose D is also surrounded by embryonal connective tissue, which in turn is covered with epithelium,

and the whole lies pendant on the upper surface of the palate. The anlagen of the maxillary bones are seen on either side at E, and the palatal processes of the same are to be noted, as darker triangular masses, growing out into the already formed but future hard palate. At F we

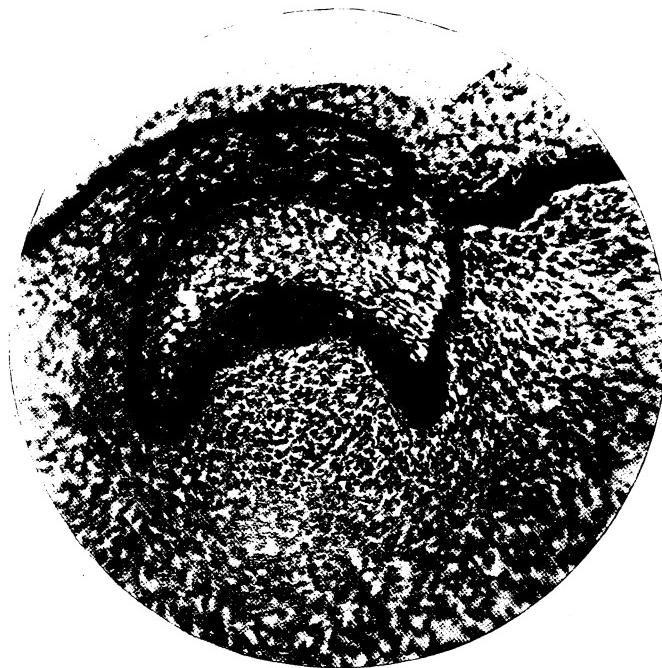


FIG. 161.

see the anlagen of two teeth, and the structure at the bottom of the picture, below A, is the upper portion of the tongue. At the lower part of the future palate, on either side of the median line C, several blood vessels are in evidence, and at the anlagen E of the maxillæ still others, yet the immediate neighborhood of the anlagen (F) of the teeth is conspicuous in that few if any blood vessels are present. In Fig. 87, article III, at 1 and 2, the condition as seen above at F is well expressed. The photomicrograph in Fig. 158 was taken from the vertical section of the head of a fetal pig. The pig measured 5 cm. in length.

Our photograph (Fig. 159) was taken from Fig. 158 in the region of the anlage (F) of the tooth at the right of the specimen. Fig. 159



gives us the appearance of the embryonal connective tissue in the above region and shows the absolute absence of blood vessels. The lense used in taking the picture was a Leitz objective No. 5 and a No. 3 ocular; the field had nearly twice the diameter shown here, and the picture was matted down for convenience, still the larger field showed no blood vessels.

This embryonal connective tissue is made up of cells lying in a non-cellular homogeneous matrix. This tissue appears to differ from that of the dentinal papilla, in that in the latter the mesenchymal cells are more closely packed together (see Fig. 156 at A), and it is identical with that of the forming dental sac. (See between A and B, Fig. 156.)

In Fig. 160 we obtain a composite picture of that which later will be of use in understanding the blood and lymph supply of the tooth. A is the dentinal papilla, B the odontoblasts, C the young dentin, D the young enamel, E the enamel cells, F the enamel pulp, etc., G the forming dental sac, H the wall of the alveolus, and I the embryonal connective tissue external to the alveolus, or, more properly, the future external alveolar periosteum.

The differentiation of the enamel cells into enamel prisms is dependent on the blood supply within the future dental sac (Fig. 160 at G); it is between the blood in these vessels and the enamel cells that the interchange takes place; later, as the tooth develops and grows upward, this same tissue, more vascular and having undergone a greater differentiation, becomes the true dental sac and produces by intra-membranous bone formation the cementum and affords its blood and lymph supply.

At the earlier stages in the formation of the tooth it can not be doubted but what the cells of the epithelial cap of the enamel organ and the mesenchymal dentinal papilla have a common source of nutritive supply, *viz.*, from the lymph, which is equally as abundant about the epithelial cells covering the dentinal papilla as it is around those cells at the periphery of the papilla which are in juxtaposition with those of the enamel organ (see Fig. 161). As differentiation goes on in the enamel cells, an impervious covering is being laid down, the final condition of which is the petrified epithelial cap; these cells are then fully developed, no metabolism takes place within them, and therefore no nourishment is necessary for them.

It is in this light that we must look upon the future source of pabulum for the tooth below the enamel-cementum junction. That the primitive condition persists, though better expressed in the formation of the dental sac, which still surrounds the tooth, even when the enamel is developed,

and is fully and best expressed when the intra-alveolar periosteum is formed and the crown protrudes through the mucous membrane of the gum.

If we examine Fig. 161, which is a picture of the epithelium of the oral cavity, the enamel organ, dentinal papilla and surrounding embryonal tissue, we observe at once the absence of blood vessels; and if one examines a large number of specimens he is most forcibly convinced that at the earlier stages of the development of the tooth rarely does one find any blood vessels in the immediate neighborhood of the same. It may possibly be said, "Your section shows no blood vessels, look at the next and all following ones and you may find some." This we have done and found them absent almost without exception.

Let us turn back and review the photographs 154, 155 and 157 and examine the thin walled vessels which we see here, *viz.*, the capillaries; for it is where they are, the business of the blood is performed. The relation of the capillaries to the cells must be clearly understood, and this brings up a teleological question regarding the nourishment of the tissues of the maxillæ, and especially those of the teeth. For the answer of the above question, we must look to the study of the lymph and lymphatics.

(The work of preparing and photographing our specimens was done at the Laboratory for Physiology and Histology of the New York College of Dentistry, with the assistance of Mr. John L. Peters.)

Demonstration of Septa in the Leptothrix Filaments of the Mouth.

By THEO. VON BEUST, D.D.S., M.D., Dresden.

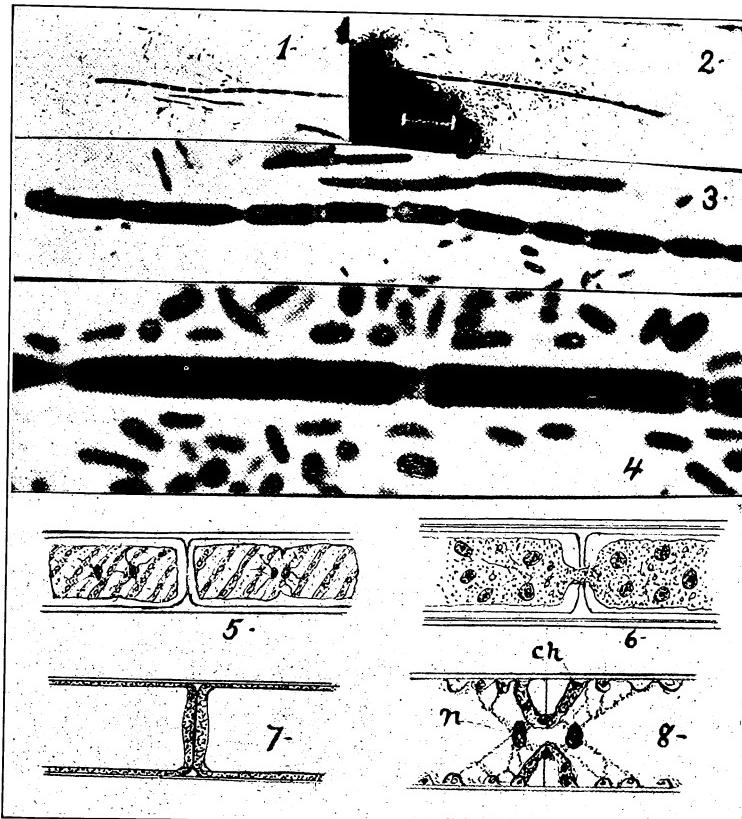
In a biological or phylogenetic comparison of the micro-organisms of the human mouth with one another or with the scale of organisms in general, it is becoming evident that not so much the general morphology as the minute anatomy of the different individuals is to be given consideration. Each discovery of an organ, or part of one, is synonymous with the discovery of a new function, for here, too, the old law "function makes tissue" is applicable.

Loewenhoek, Robbin, Hallier, W. D. Miller and others have handed us descriptions or drawings of the filamentous forms of the mouth, by the aid of which the organisms meant to be described, are recognizable. Not until the publications of Vincentini, Goadby and Williams, how-

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ever, who substantiated their observations with drawings or photomicrographs, were attempts made to treat the subject from a modern biological aspect.



The object of this contribution is to call attention to the septa between the cells of the segments of the short-celled thread forms of the mouth (Figs. 1 and 2). To the existence of these no reference has, to the best of my knowledge, ever been made. That septa are always present in the specified place we know; indeed a polycelled thread organism without septa would be an incongruity. Nevertheless, the septa as here isolated by differentiation, if further studied, may prove an invaluable aid in the systematization of the forms under discussion.

M 700



EXCLUSIVE CONTRIBUTIONS

By preparing specimens as described below and examining with highest powers, the exceedingly minute dividing walls, which lie almost at the limit of microscopic definition, are discernible.

A glance at the photographs is sufficient to justify the belief that a close analogy exists between these forms and the higher organisms here utilized as objects of comparison.

It would be presumptive to speculate upon the successive stages of formation of these septa, whether formed in a manner displayed in drawings, and just what part the nuclei exhibited by me in the *Archiv fuer Zahnheilkunde*, No. 2, 1906, take in their formation. I trust, however, that in the future advanced methods and superior facilities will permit more conclusive investigation.

Fixation in chloride of platinum-osmic-acetic

Methods of Staining. acid mixture (1 per cent. chloride of platinum in water, 15 ccm. osmic acid in strength of 2 per cent., 4 ccm., acetic acid 1 ccm.; use in 50 per cent. aquæ solution) 48 hours; follow with pyrolygenous vinegar 24 hours; alcohol 24 hours; transfer to aqueous 2½ per cent. ferri ammonio-sulphas solution 24 hours; follow with hematoxylin (1 gram hematoxylin, 10 ccm. alcohol, 200 ccm. water—must be at least four weeks old) for 48 hours. Differentiation in 2½ per cent. ferri ammonio-sulphas solution for one-half to three minutes (differentiation must be controlled microscopically); wash in water fifteen minutes; transfer to fuchsin S(O, 5 gram fuchsin S in 100 ccm. water 15 minutes; pass successively through 30, 70, 90 and 100 per cent. alcohol, xylol, Canada balsam. As no fixed rules for the differentiation can be given it is wise to treat about 20 cover glasses at once, which will always insure a number of most beautiful specimens. The treatment with fuchsin S is not absolutely necessary, its use merely increasing the value of the slides for microphotography. I have never seen the septa as clearly in slides stained by any other method.

DESCRIPTION OF PLATE.

Figs. 1 and 2, Leptotrichæ magnified about 600 diameters.

Fig. 3. Same as Fig. 1, highly magnified.

Fig. 4. Same as Fig. 2, magnified 6200 diameters.

Fig. 5. Showing septa of spirogyra. (Orig.)

Fig. 6. Showing septa of cladophora. (Strassburger.)

Fig. 7. Showing septa of mougeotia. (Benecke.)

Fig. 8. Showing cell division in spirogyra. (Strassburger.)

PROSTHODONTIA

The Problem of the Lower Extension Bridge and its Rational Solution.

By HERMAN E. S. CHAYES, D.D.S.

Read before Central Dental Association of Northern New Jersey, Nov. 16, 1908.

Mr. President, Members of the Central Dental Association of Northern New Jersey and Gentlemen:

I greet you to-night upon the invitation of your secretary, Dr. Harlan, for the purpose of placing before you and at your service, a new method or principle or contrivance to help you overcome certain difficulties in your daily practice of dental mechanics.

If I am not brief enough in coming to the point at issue I crave your indulgence and the privilege at your hands to travel along the lines laid down by myself. I would have you remember that what will take but a short time to convey to you to-night has required years to bring to an intelligent state of completeness, and that I must convey it in a form which will leave you with a clear and vivid conception of the main features of a contrivance with which you have not heretofore been familiar.

If it seems to you, gentlemen, listening to the reading of this paper, that I am deviating from the issue, pray reflect that the various branches of prosthetics are so intimately related, so intricately interdependent upon one another, as to make the success of any step almost wholly dependent upon the one immediately preceding it, and that in order to construct a perfect chain every link must be properly forged, adjusted and exactly placed in its relation to its neighbors, leaving no weak spot to give way,

no loop hole for escaping the responsibility which you may freely assume, provided that the construction of the work has been performed along the lines which I will present to you to-night.

Every paper must needs have a title, and the right kind of a title is one which will intelligently convey the subject to be treated. Therefore I have christened this paper "The Problem of the Lower Extension Bridge and Its Rational Solution," and because I possess the same amount of vanity usually found in most of us I should like to augment the title of this paper and add in very small letters "by means of the Chayes attachment," which can be made by anyone.

The safest, steadiest roadbed for any train is that which has in addition to its strong foundation two lines of good steel rails, bolted down to the road ties and running parallel to one another for the entire distance of the road.

The least fraction of deviation from the parallel means danger to the train, and the removal of one rail is preposterously out of question.

But one rail may be so placed, or rather train and bed may be so constructed that what is called a monorail system may successfully be worked. An engineer may call to his aid a long list of scientific principles and ingenious contrivances like the gyroscope, etc., to make the monorail possible, but the safest bed for a train is, nevertheless, the one which offers two of these staunch, shining, glistening bands of steel, parallel to one another, but lying in a different horizontal plane. All the foregoing is an analogy of monstrous disproportion (at first glance), but not so under deliberate analysis, and I would have you bear this in mind as I proceed with the reading of this paper.

Of all mechanical problems which present themselves to the dentist, the one solved with the least satisfaction to himself and his patient, is, perhaps, that of the partial lower denture. Particularly is this so when all the teeth posterior to the bicuspids have been lost, leaving a demolarized area (if I may coin a word) devoid of the mechanical adjuncts with which to carry on the function of trituration.

I venture to offer for the consideration and criticism of the profession reasons for the difficulty of the problem and a solution therefor which I hope will be found satisfactory to them and their patients.

The Dynamic Principles Involved. The shape of the mandible, coupled with the fact that it is the moving member of the triturating apparatus, as well as the insufficiency of surface which it offers for the adaptations of artificial contrivances, combine to make the problem of supplying posterior lower teeth an irritating and often a perplexing one.



It is only too frequently found that carefully constructed lower partials are never worn by the patient, though they seem to fit well enough and will stand critical examination as regards the execution of the workmanship, adaptation, etc. This assertion is true to a greater extent than some of us are willing to admit and a careful survey of the field of work and the limited means for the correction of this mechanical delinquency will drive it home with greater force and truer aim than my words are able to supply.

Artificial teeth are satisfactory in direct proportion to their being a close imitation of the lost dental members, not alone as regards the obvious or visible similarity, though this is important enough, but as regards their physical and actual relation to the teeth yet present and adjoining them, and those occluding with them, as well as to the soft tissues and other organs of the buccal cavity.

Further, to be satisfactory, artificial teeth (and I am speaking particularly of partial lower dentures) must not encroach upon the hard or soft tissues in any way; must exercise no traction nor undue pressure in other words, they must be physically so near the natural in construction and in action as to simulate as nearly as possible individual tooth motion.

Individual tooth motion implies the independent action of individual teeth during the process of trituration, a most necessary quality of action, which is wholly lost in the usual partial lower denture or the so-called bar plate.

And here we have one of the important reasons for the absolute unfitness of the above mentioned contrivances as adjuncts to the function of mastication.

It is true that people of great patience do become accustomed to these, at first torturing makeshifts, but this does not make them the less unfit, nor the less unscientific, nor the less inadequate as aids to the human machinery in the performance of one of the most important functions in the human economy, the proper mastication of food.

Partial lower dentures, as constructed to-day, may be said to be contrivances acting as parts of simple levers during mastication, supported in place and more or less held there by clasps or by split pins fitting into tubes placed in the root canals of the teeth granting the support.

Assuming the perfect fit and adaptation of the appliance, we have: (1) The plate on either side; (2) the lingual piece connecting these sides, and (3) the clasps or pins as supports.

Now comes the attempt on the part of the patient to masticate, successfully you would say, in proportion to the fit of the appliance. Food is forced on to one side of the mouth, the mandible is raised to approximate the maxilla; the side carrying the food strikes first, and this is what

occurs; a pressure is exerted on the side where the food rests, and this pressure is communicated along the body of the plate to every part of it, and because of the fact that there is no food on the other side to stay or arrest the motion of that side, imparted by the pressure communicated from the working side, communicated because of the resiliency of the gum tissue, this initial pressure is converted into a pull or traction which acts not only upon the pins or clasps, and hence upon the roots or teeth, but also upon the saddle or plate piece, and hence upon the soft tissue which furnishes the support for the same saddle piece.

This pressure and this traction are relative to the power of the muscles of mastication, and when one considers that at times the direct crushing force of the jaw is close to 150 pounds to the square inch we shall have some idea of the irritation caused by the unsteadiness of partial lower dentures as generally constructed. I am not calling your attention to specific cases, however, so we will put the mean of tension or power exerted by the jaws at eighty pounds to the square inch, and I will allow you to make your own deductions as to the possibilities for discomfort, unrest and consequent dissatisfaction with the class of work under discussion.

The point to be borne in mind is, that while the soft tissues could, perhaps, bear a direct pressure exercised upon them during mastication with the aid of artificial lower partials, it is the peculiar rotary action of the jaw during trituration which becomes a destructive force opposing a healthy and comfortable condition of the mucous membrane and abutments for clasps or pins.

And here is the second reason for the absolute unfitness of the usual partial lower denture as an aid to perfect mastication. They who finally do use them do so at the expense of that peculiar and most essential milling or grinding movement of the jaw; they forego it and in time unlearn it, because they remember that it hurts, and what mortal is not instinctively averse to pain?

This paper would be incomplete and narrow in its scope unless some of the other methods in vogue for restoring posterior lower teeth are mentioned and dissected.

**Fixed Extension
Bridges.**

One of the means not uncommon to-day is the fixation of a contrivance called an extension bridge on to one or two abutments.

From a physiological, hygienic and mechanical point of view this method is to be heartily condemned, although in patients whose muscles of mastication are poorly developed and the crushing force of whose jaws is, therefore, below par, or who are wearing artificial upper dentures, this class of work will stand up for quite a time and



may temporarily prove a great comfort. The ultimate result, however, will be the loss of the teeth acting as abutments, a badly inflamed condition of the gums as well as a material displacement of tissue which at some time in life might prove dangerous to the point of malignancy. Also the lasting qualities of this sort of work is very often due to the inherent resiliency of the gum tissue, and so a great deal of satisfaction is derived from the fact that the tissues of some of our patients will stand a volume of abuse before they finally rebel and must be relieved.

It is not necessary to seriously discuss the unfitness of the fixed extension bridge; we all realize the enormous leverage exerted upon the abutments, and we know the deleterious result of constant pressure and irritation upon the soft tissues; so that if we reach the conclusion that this means of restoring or supplying posterior lower teeth is not a good one, and should be conservatively used or not at all, we will spare ourselves a good many failures and our patients a good deal of pain and a good many teeth.

Removable Extension Bridges.

Several means of replacing posterior lower teeth by the use of removable extension bridges have recently been shown, ingenious mechanisms of springs, and hooks, and tubes, and locks; they all have their good points, and I am sorry to say they all have their faults at vital points, so that the matter of selection is a hard one, and in truth a choice of the lesser evil.

On examination of what I ask leave to be allowed to call the facts presented above, it would seem that a step in the right direction is the elimination of the lingual plate or bar as heretofore used; mark you, I say as heretofore used, in all lower cases; it is useless and antiquated, and at best but a point where trouble may be expected and is usually found.

An examination of the teeth in the mouth discloses each tooth resting in its individual socket, upon its own cushion or shock absorber; a more or less close study of the phenomena of mastication or better trituration shows that rarely, if ever, are more than three teeth at a time in each jaw, upper and lower, called upon to perform this function.

This admitted, let us see just what are the essentials of a good attachment for these extension bridges for the lower jaw.

Put down in the sequence of their importance they seem to be as follows: (1) General adaptability; (2) cleanliness; (3) independence of the sides in their relation to one another; (4) stability; (5) removability; (6) lack of strain on abutments; (7) possibility of coping with the problem of absorption of the alveolar ridge; (8) rigidity, but not

to the extent of opposing the rotary motion peculiar to the lower jaw; (9) ease of construction; (10) durability under stress of mastication.

Any locking or steadyng device designed for use on these extension bridges which lacks one of the qualities enumerated above comes within one-tenth of being the right kind of a device for this purpose, and one lacking two of the qualities enumerated is a fifth short of being correct.

Before describing this new lock or attachment, which I mean to show you to-night, I should like to say a few words in regard to abutments for extension bridgework.

I do not believe in roots as abutments for removable extension bridgework. The weak point of a root abutment is at the part which bears the greatest strain during tooth motion, namely, the joint of the pin, root and tooth. Besides, the point of contact between root and tooth surface is so small in comparison to the area exposed to stress and motion during mastication, that the inadequacy of roots for strong abutment purposes must be self-evident. I do not wish to be understood that I would never use a root for abutment purposes; I have used many and probably will again, but I do not prefer them for these obvious reasons. Extirpation of the pulp is invariably necessary in the preparation of a tooth for the reception of any crown, although the simple shell crown may sometimes be fitted to the satisfaction of some operators without resorting to this practice. A word or two on this point would not be amiss.

The conservation of a pulp is a desirable thing under some circumstances, and yet it is a grave question whether we are justified at times in sacrificing the proper fit of the crown and subjecting the patient

to the intense torture of dressing down a live tooth to its proper proportion, for the sake of keeping alive a pulp, the period of whose vital importance and even usefulness is, perchance, a story of the past, and when, to cap the climax, in the end, we will have completed a doubtful operation.

With present day methods of extirpation at the command of the operator, with almost certain asepsis at his beck and call, it is a more advisable procedure to extirpate the pulp in the tooth to be crowned before it is dressed down, instead of leaving an area of injured hypersensitive dentin exposed to the lasting action of the cement acid, thus at times setting up an irritation at the peripheral ends of the dental fibrils, which may and often does cause the death of the pulp and brings in its wake all the evils which are the cohorts of dead and disintegrating organic matter.

Then, too, conditions arise which make the extirpation of the pulp



in the tooth to be crowned imperative for the conservation of the tooth. Who of you but has in his practice been called upon to treat and utilize for abutment purposes a tooth, which, standing alone, has become tender and irritated, though no caries be present; and who of you will dispute the fact that this aching member became the better for the extirpation of its pulp, the more comfortable for the patient, and the safer as an abutment? What really took place here, after the extirpation of the pulp, was a deflection of the blood current from the pulp to the cementum and peridental membrane, causing an increase in blood supply, and consequently an increase of the amount of vital resistance to destructive forces usually attacking the teeth in the mouth. Thus by what is erroneously called "killing the tooth" you have saved it for the patient, which, though a little paradoxical, is nevertheless true.

A good rule to follow in the selection of abutments is to choose one that will give the greatest amount of surface to the adhering qualities of a good cement, not because we care to depend upon the cement entirely, but because of the large contact area between the tooth and shell or other crown.

Strong results and very artistic ones can be obtained by using the shell crown, the labial surface of which is made step shaped and covered by a Steele backing, upon which is slipped into place a Steele interchangeable facing. A crown of this kind properly fitted and thoroughly seated upon the tooth beneath it will rarely if ever come loose.

I prefer to make a flat topped hood of 36 gauge platinum with a labial step, and since we have the casting process it is easy to restore the rest of the crown with the inlay wax. The Steele backing made of platinum throughout is waxed into place, and the whole is invested in the flask containing the inlay investing compound; the wax is burned out and the gold cast in.

The crown is chilled, cleansed and placed upon the tooth in the usual mode of procedure; a bite and impression are obtained, casts are prepared and articulated or occluded as some will have it, and we are ready for the attachment.

**The Chayes
Extension Bridge
Attachment.**

This attachment consists primarily of a single bar carrying two locks, one distally and one mesio-lingually, parallel to one another, but lying in a different horizontal plane, a hood covering the bar and engaging the locks thereon.

The bar is attached to the abutment while the dummies to be supplied are joined to the hood, which also carries the saddle piece. The length of the entire lock is equal to about one-half of the distance from

the distal surface of the abutment to the distal surface of the last dummy varying with the case, and the method of its construction is as follows:

The bar is constructed by doubling upon itself a piece of 22 gauge clasp metal (Fig. 1) varying in width directly as the depth of the space

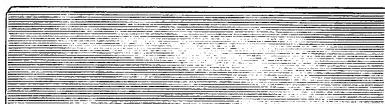


Fig. 1.

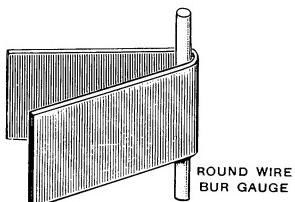


Fig. 2.

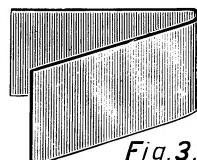


Fig. 3.

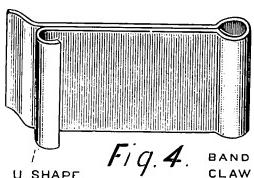


Fig. 4. BAND CLAW

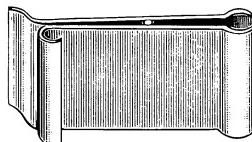


Fig. 5.

between the alveolar ridge of the lower and the teeth of the upper jaw. By inserting a piece of round wire of suitable thickness (Figs. 2 and 3) you shape the distal end of the folded clasp metal into a round band, while the mesial ends of it are diverted from each other (Fig. 4). The two plates are now joined at the center with a high grade solder. Shape or bend the linguo-mesial end of the clasp metal into a U shape. Thin down the distal, ring-shaped part of the bar at its extreme distal surface, and sever it at the center (Fig. 5), which will give you a claw, or band-shaped spring, at the distal end of the bar and a U-shaped one at the linguo-mesial end of it. The lower surface of the bar designed to approximate the alveolar ridge is so filed as to assume the necessary contour so that when it is finally soldered on to the abutment (Fig. 6a) the

contour of its under surface corresponds to the alveolar eminence of the case. (Fig. 6b—Same with hood in place.)

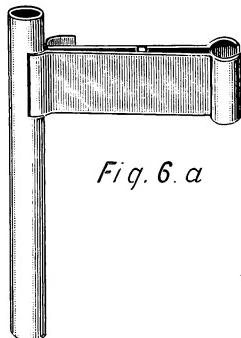


Fig. 6.a.

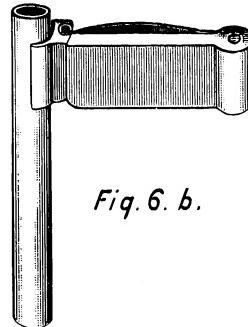


Fig. 6.b.

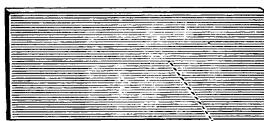


Fig. 7. PLAT 30 GAUGE

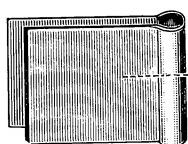


Fig. 8.



Fig. 9.

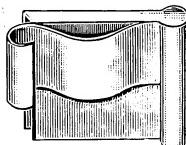


Fig. 10.

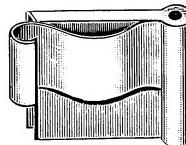


Fig. 11.

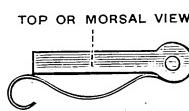


Fig. 12.

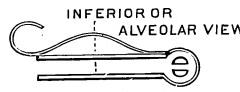


Fig. 13.



Fig. 14.

Construct a hood of gold or platinum 30 gauge to snugly fit all but the lower surface and mesial end of the bar, allowing the open part of this hood to reach the alveolar ridge (Figs. 7, 8, 9). Then through that part of the hood fitting over and around the band-shaped claw of the bar, drill a hole to receive a split pin, belly shaped at its central por-

tion, which pin is then attached to the hood (Figs. 10, 11, 12, 13, 14). A piece of clasp metal or irrido-platinum, 28 gauge, is then so shaped at one end as to engage with precision the U shape of the linguomesial end of the bar, while the other end of the strip of metal is soldered to the hood. Thus the band-shaped claw of the bar engages the belly-shaped split pin of the hood, and the U-shaped strip attached to the hood engages the U shape of the bar, and if the four points of resistance were connected by lines we would have a parallelogram.

The bucco-mesial end of the bar and the mesial surface of the linguomesial end of it are now soldered to the distal surface of the abutment.

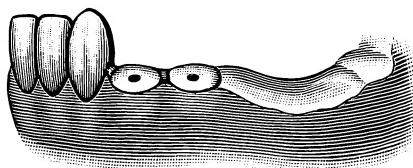


Fig. 15.

Selecting the proper Steele facings for the case the backings are waxed to the hood resting upon the bar; hood and backings are removed, invested and soldered; replace the now connected hood and backings on the bar. The occlusal surfaces are either swaged up of plate gold or constructed by the casting method, and are also soldered to the hood which now carries the backings and facings plus the cusps.

Replacing the hood again upon the bar, assuming, of course, that the piece has been more or less finished as far as filing and stoning are concerned, the saddle is waxed up, care being taken not to allow any wax to flow into the hood. Pure beeswax, the outside of which is stiffened by flowing over it some hard wax, is the best for this purpose; the whole is chilled and is ready to try in the mouth.

The abutment carrying the bar is placed upon the tooth and the hood carrying the backings, facings, cusps and saddle is allowed to go into place. The patient is permitted to bite and grind and bite again, and any imperfection of the saddle or occluding surface can now be corrected. The piece is chilled and removed from the mouth.

The hood is now removed from the bar, the facings slipped off the backings. The hood is filled with a thin mix of plaster to prevent the ingress of rubber and the piece is flasked morsal side down. In the usual way rubber is substituted for the wax and vulcanized.

Before placing the finished piece into the mouth a $\frac{3}{32}$ d of an inch is filed off the top of the bar; thus when the contrivance is in place the top of the bar will not reach the top of the hood, and consequently there will be no leverage exerted upon the abutment. Any pressure exerted upon the piece during mastication will be taken up by the alveolar ridge (Figs. 16 and 17).

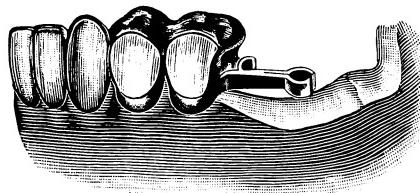


Fig. 16.

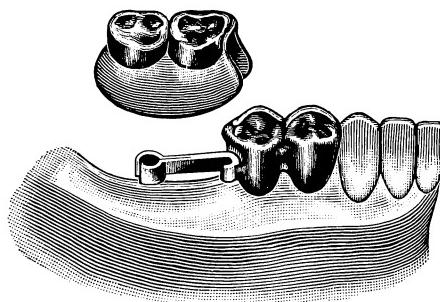


Fig. 17.

Because the force used in mastication or trituration of food is a rotary one and the two parallel locks are placed upon a horizontal bar, soldered perpendicularly to the abutment, the contrivance can not be displaced during mastication; it can, however, be removed by exercising a slight pressure or pull in an upward direction perpendicularly to the horizontal plane of the bar.

In cases where the bicuspids and molars have been lost, leaving but the six anterior teeth in place, the cuspid on each side has been used and the lock bars attached to them, while lingually they were connected by a bar of irrido-platinum U shaped and dropped well beneath the lingual gum margin of the incisors. In these extensive cases there is

sometimes a tendency to cut the food with these artificial contrivances, creating a condition during which the piece may be unintentionally dislodged. To obviate this an undercut is placed at the distal surface of the abutment (Fig. 17), and is engaged by a corresponding sloping portion on the mesial surface of the first dummy.

I may be criticised for uniting the cuspid abutments lingually in bilateral cases, but please remember that in this instance the bar exercises no traction or pressure upon the tissues and can do no damage.

Never have any of these pieces been constructed carrying more than three dummies on either side, bearing in mind that as a rule three teeth in each jaw are used at any one time during trituration.

Conclusions:

1. This attachment can be universally used as far as lower cases are concerned.
2. It is very clean, the gum contact between bar and alveolar ridge is decidedly small and a piece of tape can, if necessary, be passed under it for cleansing purposes.
3. The sides are independent of each other, restoring as far as feasible individual tooth motion.
4. It is stable, because of the double track.
5. It is removable, hence hygienic.
6. It does not exercise any appreciable strain on the abutments, because the top of the bar does not reach the roof of the hood, allowing the alveolar ridge to do its work.
7. Absorption of the ridge having taken place the saddle can be added to at any time and proper relations between hood, bar and occlusion can be restored.
8. It is rigid enough to resist lateral motion and yet there is yield enough between the split pin and the band-shaped claw distally, between the two U shapes lingually to allow for the rotary motion of the jaw.
9. It is easily constructed after the first attempt; and
10. It is practically an indestructible attachment.



American Society of Orthodontists.

Address of Honorable H. B. F. Macfarland,
President Board of Commissioners, Washington, D. C.

Mr. President: It is my happy privilege to welcome many conventions to Washington on behalf of the government of the national capital. I think we have at least one each day the year through. I assure you I welcome this convention with especial gratification, because we know how important your work is to the whole community. It is especially gratifying to know you have representatives here from Mexico, Germany and Australia. It is an international gathering. As this is the national capital it is especially appropriate that you should meet here, because of the international character of the convention and because of your members who are of our own household.

We have no keys to offer you, because we have no gates. All are welcome at all times. Neither do we have to offer you the freedom of the city. All Americans are born free, and are citizens here by right of their birth. Those from other lands are made to feel they are adopted into the family for the time being. Our great desire is that all of you should feel perfectly at home here.

We covet the interest of those who are Americans in all the development, upbuilding and beautification of the common national capital. We believe that every time you come here you go away richer in your patriotism, and are more desirous than ever before to have the national

capital made all that it ought to be, physically, and in its laws and customs. In your profession your object is to raise the ideals to the highest scientific plane, and you gentlemen of science will unquestionably have a great effect upon the work of your profession in Washington. At the same time, we believe and expect you will feel, after you have been here, that your coming has been of benefit to you. You will not only see the President of the United States and others in high authority in the nation, but you will be especially interested in some of the scientific collections and the great Library of Congress, and in the other things which draw scholars and men of science from all over the world to Washington. When you go away from Washington, assure your Senators and Representatives of your cordial interest in all they do for the development of the national capital. We who live here—three hundred and thirty thousand people, one-third of them colored (the largest colored population in the world)—are glad and proud of our right and privilege to pay one-half of the maintenance of the national capital, and the rest of you pay the other half. We pay sixteen dollars apiece and the rest of you pay about six cents apiece. I am sure you would be willing to double it if you had the opportunity! Certainly you want this capital to be worthy of this country, and as the country grows you want to see the capital grow in proportion so that when our friends come from abroad they may see here, as it were, a symbol and a sample of the whole country, and may appreciate at once the real greatness, the true greatness, of the United States.

We are heartily glad to have you here, and hope you will greatly enjoy your visit. We hope your deliberations will be profitable to you, and are sure they will be profitable to the members of the profession in our city. We are fortunate in having some men here worthy of the best traditions of the profession, and in whose skill and scientific ability we repose the utmost confidence. They, and the younger members of the profession especially, will be greatly benefited by your presence.

Mr. President and Gentlemen: I feel, in a cer-

Dr. Ottolengui. tain sense, honored by this call on the part of the

President. I had no idea when I succeeded in getting the Honorable Mr. Macfarland to speak to us, that I was, in a sense, setting a trap for myself.

We are very glad to be here; we are glad to come to the capital of the nation, and we would be very glad, indeed, if we were privileged to do so, to pay the sixteen dollars and allow the disfranchised citizens of this city to pay the six cents! I understand now that there is some little advantage in not being permitted to vote here, because every man I have met has told me that had he been allowed to vote he would have



ITEMS OF INTEREST

voted for the winning ticket. It is pleasant to feel that the man you wanted got elected, and to realize that you have not committed yourself by voting the other way. That is one advantage which I hope will compensate for the loss of the voting power. On the other hand, there is another great advantage about living in Washington, *i. e.*, you are living in what is already the city beautiful. It is the only city, I think, in the United States having a law which prevents the building of ugly buildings. In that sense you have an advantage over New York. It is delightful to see that every new addition to the city is a little more beautiful and artistic; an evidence of the growing character and refinement of the country.

It may not be amiss to say one word to the Commissioner so that he may excuse us from the seeming courtesy of a small audience. We want him to know we are a small body of men; that it is not possible to have an attendance of two or three thousand with a membership of less than a hundred, but it is a well-known fact that science has never been advanced by the operations of the mob, and the reason why this society was organized was because the few earnest workers in the field found they were lost in the "mob" at dental conventions, and they have separated themselves and their work from the dental profession without losing their allegiance to the profession—simply that they might specialize. The art, in that sense, is young, but in fifty years from now, if the Commissioner will come and give us another address, we can promise him an audience of two thousand.

I thank the Commissioner on behalf of the society and guests for extending the very hearty welcome to the City of Washington.

I have belonged to the society for a long time,
Dr. Jose J. Rojo, and do not lose a chance of reading the papers as
Mexico. published in the ITEMS OF INTEREST complete. I
want to say to you that it is the seven or eight thou-
sand kilometers which keeps me away from you, and does not allow me
to come as often as I wish. Nevertheless, I am constantly in touch with
the work of the society, and most of my time is devoted to the special
practice of orthodontia. All of my friends who are familiar with the
progress of orthodontia, and especially those who know of the American
Society of Orthodontists, send their hearty greetings and best wishes
to this Congress, believing that your work will be in the interest of the
advancement of the science of orthodontia.

President's Address.

C. A. HAWLEY, D.D.S., Washington, D. C.

It is my most pleasant duty to greet you on the occasion of the opening of this eighth annual session of this society. For the honor conferred upon me, and for the pleasure of presiding at this meeting, I most heartily thank you.

The society is nearing the close of the first decade of its existence, its organization being co-incident with the ushering in of the twentieth century. Many of its aims have been already accomplished; many of the early difficulties have been overcome, and we can look forward with assurance that history will regard the work of orthodontia as one of the main features of the twentieth century progress in the perfection of the human race.

Why not? Do not the abnormal conditions that surround the etiology of malocclusion strike at the very vitals of the welfare of the human being? Any derangement of the dental arch detracts to that extent from the efficiency of the masticatory process which is essential to the proper preparation of food. The derangement of the dental arch is accompanied with narrowing of the nasal passages, with the usual accompaniment of pathological conditions and obstructed breathing. Without nourishment of the body by food and oxygenation of the blood by air, the body cannot exist. These conditions that accompany malocclusion of the teeth are seriously detrimental to both, and thus seriously affect the growth of both physical and mental welfare of the individual.

Without arguing the question at any length, I assume that you all agree with me that the tendency of recent thought is toward the view that, in a broad sense, malocclusion is a result of a lack of development, arrest of development or faulty nutrition. Investigation of the teeth of primitive races shows that in the state of barbarism the teeth and arches were practically perfect. In changing from the state of barbarism into civilization the food habits have been changed, and with that change in the character and preparation of food has come disaster to the teeth. The profession of dentistry was built on that disaster. The change in character of food favored caries of the teeth, and their defective condition more and more encouraged such preparation of food as would not require their use until generation after generation the tissues have lost their strength and tone. The condition has been intensified by the lack of use of these organs through

the growing period of life in children of the present day. While we have left the former point of view of the influence of heredity in the etiology of malocclusion, it is my opinion that we must come back to another and broader view of its influence in these conditions. Undoubtedly, the change from an active out-of-door life in our more primitive state to the sedentary life of the present day has produced a similar effect on the bony tissues of the nasal passages, and coincidentally we have the increase in the pathological affections of these tissues and faulty habits of breathing. These two causes are so interwoven and interdependent of each other that it is difficult to assign to each its separate place in the etiology of malocclusion.

**Influence of
Use upon the
Dental Arches.**

During the year a most valuable contribution to this subject has been made in the report of Dr. Louis Ottofy, on the teeth of the Igorots. While his investigation may possibly reveal nothing that

was not believed to be true of all primitive people,

yet the fact that they exist to-day and may be studied at first hand gives them great value. They are living in the most primitive condition, unaffected by either the benefits or vices of civilization. The examination of their teeth showed an almost perfect condition, there being no malocclusion, and their arches perfect. There are only two per cent. of the teeth decayed as compared with about twenty per cent. in the civilized races.

Dr. Ottofy gives two reasons for the perfect condition of the teeth of these people; first, the open air life which they live, and their consequent physical vigor; second, the character of the food, which necessitates thorough mastication. The Igorots live, for the most part, on rice and *camotes*, a kind of sweet potato. They are neither of them cooked to the point of disintegration, but impose severe work upon the teeth. The use of such food begins as soon as the temporary teeth erupt and are ready for use. The children are also in the habit of constantly chewing rice between meals.

For myself I may say that the results here shown have added weight, because in my own observation among my patients, all of the cases of perfect arches that I have found give a history of some unusual use of the teeth, and most of them were inveterate gum chewers. Within the year a girl of fourteen was brought to me with one of the best developed dentures it has ever been my pleasure to see. Investigation of the case developed that narrow arches and impending irregularity had been pointed out to the mother seven years before, with the advice that the diet should consist, as much as possible, of



food that required thorough mastication, and the advice was strictly followed, with the happy result described.

If these deductions are true, then the important question before a civilized people is: First, "Are these conditions that have caused a degeneration of the jaws of the face capable of a sweeping change, and are the changes such as can be incorporated into a civilized life?" In other words, "Must we return to barbarism?"

So far as the question of a greater amount of open air life is concerned, it has already been shown conclusively in the treatment of tuberculosis that more open air living is necessary, not only to rid us of that "scourge of civilization," but for the healthy life of all people, whether in danger of that disease or not; and that no return to barbarism is necessary, but that the required conditions are even better carried out with the necessary modifications of our present mode of living.

So also in regard to the teeth, no return to barbarism is necessary, but *there must be a radical change in the selection and preparation of the food of a child until the denture is complete.* The medical profession have perfectly worked out the necessary component parts of the food of infants and children, so far as the proportion of proteid carbohydrates and fats are concerned, but have totally neglected its preparation, or rather selection, with a view to the development of the teeth and jaws. And here we have great encouragement in the fact that food experts are recommending largely more natural foods, many uncooked and requiring thorough mastication, recognizing from the standpoint of assimilation and digestion that complete mastication is essential. We have vastly the advantage of any previous state of civilization in the great variety of foods that will satisfy the requirements of mastication. It is the duty of this society to enforce upon the public attention the necessity of reform in food habits. As a liberal profession we will not do our whole duty if we confine our energy to remedying evils now existing.

Orthodontia has placed a new value upon the teeth. In addition to being organs whose neglect causes pain and brings disease, whose use in mastication gives pleasure, and whose preservation conserves beauty, they have a mission in the development of the face which must be understood and recognized. The establishment of this recognition is the mission of orthodontia.

The teeth are the only organs in this region whose position can be accurately determined. By long observation of perfect specimens we know the normal form of the arch, and by measuring the teeth we can determine geometrically that perfect form for any given case.



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By the facts of normal occlusion we know the relation of one jaw to the other. The teeth, then, form a standard of development for the maxillary bones, mandible, nasal passages, and all the contiguous tissues. Their roots set deeply in the maxillary bones, are the only levers by which, through forces applied to their crowns, abnormal positions of these bones can be remedied.

When these facts are properly understood, the public estimation of the value of the teeth will be tremendously increased, and it will only be when their real value is comprehended that we can hope for the changes in food and habits of life necessary to check the present degeneration.

Dentistry is appreciated and remunerated in direct proportion to the value a people set upon the teeth. Both in the organized society, and in their individual work in a community, the orthodontist possesses the greatest opportunity to teach these truths and thus contribute vastly to the welfare of the dental profession. And it is upon this broad ground that we invite co-operation and support. To my knowledge, no other specialty stands in this unique relation to its profession with such great opportunity of mutual help.

It is with the greatest satisfaction that I call attention to the most excellent programme prepared by the Board of Censors. We must not forget that we will be judged most critically by our practical results, as well as our high aims, and we call attention to the valuable clinics as well as the papers.

In no other specialty is there so great an interchange of patients as in ours. Most of them are young and unsettled in life, and as the period of treatment and retention extends over several years, constant co-operation is necessary. Let us not go home from this meeting without having made the personal acquaintance of every member. Let it be a meeting for the cultivation of good fellowship, as well as scientific attainment.

Discussion of President's Address.

Dr. Robert Dunn. With reference to Dr. Ottofy's article, published within the current year, and especially regarding his comments on the subject of preparation of food for the child during the eruption of the deciduous teeth, I think we will find in further research that therein lies one of the causes of a great many of the conditions of malocclusion with which we meet. I may also add that we can look to the length of time and the manner of using the nursing bottle as a factor in producing a great many cases of Class II. I have given considerable study to malocclusion of the deciduous teeth, but

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I am not at present ready to give you anything of importance on this subject. However, I think the point I mention will be worthy of considerable investigation.

It is a pleasure to know that work is being done

Dr. E. H. Bogue. in many places along the lines of thought evidenced in Dr. Hawley's address.

Dr. Horlicka, whom we are to hear at this meeting, has lived among the Indians for several months in order to study in the same direction.

In England, Dr. Sim Wallace has been examining into the results of proper feeding of the human animal for some time, and so earnestly is he engaged in doing so along these lines that he has now about one dozen little children being fed as Dr. Hawley has suggested.

Up to the present time those gentlemen have almost uniformly found the temporary teeth in good arrangement, and the bodily strength which has been vouchsafed to each one of these twelve children has seemed to protect them, for not one of them has ever been afflicted with the so-called children's diseases.

It is to be hoped that these experiments in England will show us definitely within the next five or six years the absolute truth of the ideas enunciated by Dr. Wallace, and by our president, that the character of food of civilized races is one of the very largest factors in the health of those races.

We, as civilized people, survive treatment that would kill the savage. It has taken many generations to inure us to clothing, for example. The civilized man can endure, as a rule, more than the savage can, work longer and harder.

On the other hand, put a naked savage into clothing and set him to work, and let him get sweaty, and he is quite likely to die of tuberculosis. The Indians of our western plains, who have been put into houses warmed for the winter, and not provided with modern systems of drainage, are dying off as rapidly as that man could wish who thinks that the only good Indian is a dead Indian.

One point in that address struck me forcibly,

Dr. Varney E. Barnes. *i. e.,* the remarks concerning the temporary denture which had been diagnosed as imperfect, and then the statement that seven years later the arch was perfect. I would like to see that mouth five years later and note the third molar positions, for they mark the completion of a perfect arch. Arches may be seemingly perfect back as far as the third molars which are so often far from normal positions. Arches may be nearly perfect in outline, but still be too far posterior. The arch in question has the record of having been imperfect, and as the third molars are not yet in, it is too soon to say that



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it has become perfect. This case, if followed up, should give us some valuable data in about four or five years on the eruption of all the teeth.

Our president has given us something to think

Dr. Burt Abell. about. We know that no reform is brought about except through public sentiment, and while we are a small body we have the sanction of Holy Writ for saying "a little leaven leaveneth the whole lump." We must broaden our ideas of the education of the dear public a little bit, and we have something to work on when we call to mind the fact that there are certain so-called fads becoming more and more prevalent; such as sleeping out of doors, athletic fads, uncooked foods, etc., which are taking a strong grip on the American people. The thought occurred to me that perhaps if we could point out to the parents of these little patients of ours the fact that there had been a mistake made on the part of the mother, possibly in not giving this particular child the proper chance in life, whether it be prenatal or other influences, that it might not be so far amiss. In cases where other children are to be born into the same family, we might thus help to rid them of malocclusion. We have the best and most intelligent people for our patients; they are practical when it comes to teaching them about things we think we know. If there is a preventive of malocclusion in the way of correction of habits of parents, it is our prerogative to point these out.

I was delighted with the address of our presi-

Dr. Jose J. Rojo. dent, and I know very well that when I read it slowly and carefully I will like it and understand it much better. I wish to say that I do not think simply that mastication, or the lack of mastication, or the exercise it brings about, is the most important factor in irregularities of the teeth. I believe there is one still more important, namely, the inheritance of some disease, such as syphilis. That causes a lack of development of the whole body, thus affording a cause for the irregularities. Besides that, I understand the president to say that we know by studying the normal and anatomical arches, what a normal arch is, and that we may be thus enabled to place the teeth geometrically where they belong. I have been struck with that idea many times, thinking that if the teeth are irregular it depends on a lack of development of the jaw bones. The rules of orthodontia require that we shall not extract the teeth. We are to force the alveolar process to develop to where it should develop, but no more. I think in some of the cases it will be necessary to exercise much judgment to decide what to do; either to place the teeth geometrically where they belong, or do something else, such as extracting one or two teeth. Although I remember well the teaching by Dr. Angle, nevertheless I think it is necessary to take these things into consideration.

**Dr. Parker,
of Australia.**

I assure you of my appreciation of the paper of Dr. Hawley. It is one of those papers which require reading and study. I think dentists neglect orthodontia because of a lack of interest. I believe that such a dentist is committing as great a crime as he would be in neglecting a knowledge of antiseptics in his work.

In the course of my reading I remember noticing a remarkable case of a family of seven children. The arches were well developed, and the teeth remarkably free from caries. The eighth child was examined and it was noticed that a terrible condition of irregularity and caries existed. Upon investigation it was learned that this eighth child had been brought up on the bottle, and the previous children had been breast-fed.

Another point Dr. Hawley referred to is the mastication of food. I think teeth were put in the head for use; if not used they are abused, I believe. It is not only the exercise of the teeth, but the exercise of the surrounding parts which helps. In the case of the blacksmith, his arm is developed. The same with the mastication of foods, if the rolling mills do the grinding for the individual, the jaws, teeth and surrounding tissues suffer.

Dr. Ottolengui. I want to touch upon one particular phase of the address of the president: that is co-operation and

practicability. We are a small body of specialists at present in this society. What ought to be the future of the society? We have finished our schooling and have the foundation laid. We meet problems every day in our work, the solutions of which can only be attained by some extra thought and skill on our part. I want to touch upon the relation between scientific research and practice. It is common for dentists to say to an executive committee, "Now get some practical papers; we do not want any of these high flights of scientific research." Our society must realize that we should aim at a happy medium. We have not the time in our short lives to solve all the theoretical problems, no matter how important they may be. We can not study all the relations of comparative anatomy, no matter how interesting they may be. What are we doing as a body of men, associated together? Let us attack those problems which have an important bearing on our work, so that we can, year by year, take our cases with more confidence. For instance, less than ten years ago the etiology of all these conditions of malocclusion was largely an abstract proposition, but now under the guidance of some of our advanced thinkers who advise us to regulate teeth before they become irregular, it becomes a fundamental necessity that we should understand more of the etiology of these cases. If there is an etiological factor at work in a given case, the mere mechanical rearrangement of



the teeth at six years of age will not necessarily prevent malocclusion. Let us not fly too high in our abstract researches, but let us put our minds to work to attack those problems which have an important practical bearing on our every-day work.

I do not believe those problems can be so well solved by individuals working alone. I make a plea to our members to do the best you can to co-operate with men who are studying some etiological factor, and aid them all you can with your experience.

In arranging the programme of this meeting we have had this idea in mind. For example, our president last year introduced the question of whether we should continue to use German silver arches and appliances, or whether we should rely upon the noble metals. We felt that the discussion of that paper at that time was very largely theoretical, and we searched for a gentleman who would take up this problem and make an investigation of it in a real scientific way, because we knew that if he could bring us any real facts about the influence of the various metals in the mouth, we could utilize them practically. We were fortunate enough in engaging a fine student, Dr. Clarence Grieves, to take up this study. He was obliged to have appliances which were used in the mouth. He tells me that even the year's work which he has put on it has not been sufficient to bring about absolutely certain data. I hope, after you have heard his paper to-morrow, if you feel as I do, that it is important in its practical bearing, that you will endeavor to persuade him to continue this work, and then give him a very full co-operation during the coming year.

Let us engage one mind in doing the actual work, and let each give every assistance in his power, and we may thus accomplish more than the mere listening to scientific lectures.

Mr. President: A very interesting article on **Dr. D. Willard Flint.** diet, its early history, with an account of its pioneers, is found in *Munsey's Magazine* for October and is well worth reading.

Speaking with reference to fads, the development of malocclusion of children's teeth is no fad with the parents. It is a serious thing, and I find the parents are much more susceptible to teaching and instruction than the general practitioner who knows practically nothing about the work and has no particular interest in that direction, nor inclination to investigate.

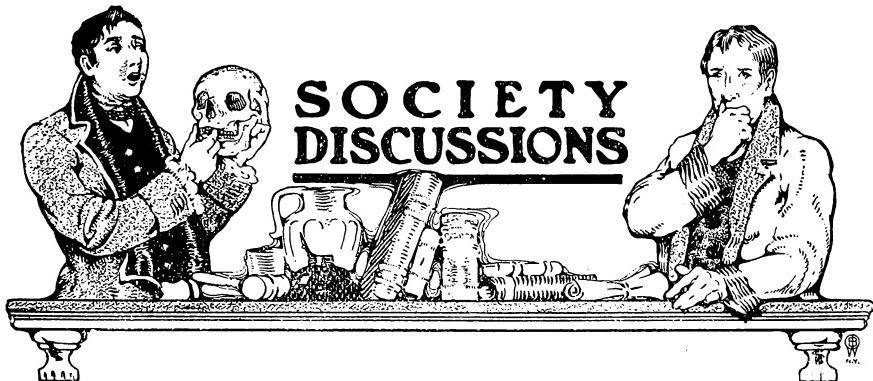
Dr. Ottolengui was speaking with reference to men shooting too high. I think we have men, many of whom are capable of reaching out

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into those fields, which the general practitioner of orthodontia has no inclination or qualification for investigation. If they thus reach out it may enthuse to greater effort and throw light on matters connected with our work and generally better enable us to instruct our patients, who are the ones that will derive the benefits, and are anxious to be instructed. At times I have had parents referred to me who have been advised to have a tooth extracted for their child. I had a case yesterday where a young lady had a tooth extracted after having been so advised by three different dentists. The mother held up her hands when I showed her from diagrams what an injury had been done to the child. She thought it was the duty of the general practitioner to be informed on such matters. In the cases of children I find parents are anxious to be properly instructed, and will generally follow out such instructions carefully.

Dr. C. H. Hawley. There is nothing more I wish to say on the subject. I thank you for the discussion.





SOCIETY DISCUSSIONS

Central Dental Association of Northern New Jersey. November Meeting.

A regular meeting of the Central Dental Association of Northern New Jersey was held at Davis's parlors, Newark, N. J., on Monday, November 16, 1908.

President Hane called the meeting to order.

On motion it was resolved that the regular order of business be dispensed with, excepting the offering of a proposed resolution with reference to a memorial to the trustees of the Thomas W. Evans fund.

Dr. Chas. A. Meeker then offered the following resolution which, after some discussion, was adopted:

WHEREAS, The members of the Central Dental Association of Northern New Jersey are assembled in their regular session.

WHEREAS, They are deeply interested in all that pertains to the advancement of their profession.

WHEREAS, The dentists of Philadelphia in public meeting have presented a set of resolutions asking that the Thomas W. Evans fund be used to found an independent postgraduate school, where all earnest practitioners of dentistry can perfect themselves in the newest dental discoveries.

AND, WHEREAS, Such a postgraduate school would be of inestimable value not only to dentistry, but to the world at large.

Be it therefore Resolved, That the members of the Central Dental Association of Northern New Jersey heartily sympathize with the founding of an independent postgraduate school.

Be it further Resolved, That the postgraduate school will accomplish



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greater good if it is independent of any undergraduate dental school, since undergraduate schools are conducted purely for the needs of beginners.

And be it further Resolved, That the president and two members of this society be appointed a committee to send a copy of this memorial to the trustees of the Thomas W. Evans Museum and Dental Institute Society.

President Hane then introduced Herman E. S. Chayes, D.D.S., of New York City, who read a paper entitled, "Problem of the Lower Extension Bridge and Its Rational Solution."

Discussion of Paper by Dr. Chayes.

I am very glad to be here to-night, and am particularly interested in the subject which the essayist **Dr. P. B. McCullough, Philadelphia, Pa.** has treated. I appreciate the skill required to produce work of the character he has presented.

All that he has said about the unstability, the riding back, etc., of the ordinary, simply constructed, partial lower denture, with more of them being used in the pocket than in the mouth, has been my experience. So much so that I have felt better results are obtained by leaving the three missing molars without substitution when the other teeth remained.

His objection to root abutments I can not say has been sustained. The question of choice does not remain with the dentist. The condition as presented is what we have to provide a remedy for.

A root without a crown is just as strong as a

Root Abutments. root with a crown, other conditions being equal. In other words, if a root is strong enough as an abutment for a given piece of bridgework with a crown on it, that same root is equally strong with the crown removed, provided the method of attachment to the root is sufficiently strong for all the stress to which it may be subjected, the root not being the point at issue, but the method of attachment.

The problem of the devitalization of the pulps

Pulp Extirpation. of teeth to be used as abutments I would rather interpret conservatively. The question of the advisability of devitalization is best answered by the age of the patient. As age increases, in equal proportion the value of the pulp decreases. At the earlier periods it is important to preserve the pulp, and when a conservative amount of tooth structure is removed and proper care is taken to avoid irritation, the pulp is not in danger.



When the essayist says that the irritation produced by reducing crowns is such as to impair the vitality of the pulp, that means the particular method he uses, and which is generally used for reducing crowns; and truly the particular method he had in mind will produce just the result stated. But one need not use the method which causes so much destruction to the crown as to imperil the pulp.

As to the statement of the devitalization of the pulp allowing an increased supply of blood to the pericementum, and thus increasing the vitality of this membrane by cutting off the blood supply formerly delivered to the pulp, I think that a theory which can hardly be substantiated. Very often an explanation for the improved pericemental condition of the tooth as the result of devitalization, is that pain from a pathological pulp is often mistaken for a pericemental irritation, a pericemental abscess; and when there is failure to obtain results from local treatment and the pulp is devitalized, the root becomes stronger. That is because of the removal of a pathological pulp and not because of the increased supply of blood to the pericemental membrane.

As to the mechanical properties of this appliance
Levers. the essayist is using as a basis of measurement the principle of the lever.

The simple lever consists of three parts, the "short" arm, the "long" arm and the fulcrum. In all classes of cases where a support at one end alone is provided for a bridge, the principle of the lever, as a basis of measurement, applies if that principle be reversed; for it is always minus, under dental operations of this kind, never plus. In other words, the arm holding the teeth becomes the "long" arm of the lever; that which in theory we would like to have the strongest arm of the lever becomes the weakest for anchorage because it is shorter between the fulcrum point and the end of the abutment and longer from the fulcrum point to the end of the saddle receiving stress. Therefore, greater stress is put on the power arm of the lever than the shorter weight arm, or anchorage is able to resist.

In other words, the short arm of the lever becomes the anchorage arm and the long arm of the lever becomes the piece on which the artificial teeth are substituted.

The reverse of this is the only way to obtain the proper application of the lever principle in bridgework, and that is never possible on one side of the mouth.

The unique feature, and a distinguishing and interesting feature, about the appliance is that the essayist provides for *vertical play*, so that under stress the gum receives the greatest share of pressure. That is the true principle. But without this supporting bar the piece can not remain in place, and pressure on the bridge must be greater at the distal



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end than at the mesial end, by virtue of the fact that it is anchored alone at its mesial end.

Like some other men who love the pursuit for the sake of the pursuit rather than for the profit, I have spent a good deal of time trying to fill this space, I can, therefore, appreciate the labor involved in the attempt by the essayist to solve scientifically this problem.

I have this to say about the paper. It is a curious

Dr. Ottolengui, curious fact that if there is a real good thing somewhere, one of your essay committee gets it first. I
New York.

have been trying for years to get just such a paper as this, and I have asked a number of men to write a paper on the subject, but have been unsuccessful.

Dentistry is coming more and more to exact and scientific methods of work, and that is being brought about by specialization; men devoting themselves to one particular branch and mastering the problems involved in it. That was not possible when a man in one hour would put in an amalgam or gold filling, in the next make a bridge, and in the next take up a case of orthodontia or one of the pyorrhea, and do all in a more or less empirical way.

It seems to me the practice of bridgework in dentistry has been, more than usually so, devoid of a real study of scientific principles involved. For example, we call it "bridgework." How many of the so-called "bridgeworkers" know anything about "bridgework" outside of *dental* bridgework? Yet I have found that the building of bridges is an art in itself, and it was after an accidental visit to a real bridge that I conceived the idea. I saw in course of construction the longest cement bridge that has yet been built in the world, and when going over it with the contractor I found the spans were first laid with steel, a skeleton form of construction, and the cement was then built around that. It seemed to me as I looked at this bridge, which was three-quarters of a mile or more in length, that this skeleton steelwork looked very slender for the weight it was expected to bear, and I questioned the contractor. I said, "Are they made small because the pay you are receiving is small, or have they a real scientific relation to the bridge?" And he replied, "When I took this contract I knew about building the cement part, but I did not understand the dynamics of this work, and I placed that problem in the hands of one of the professors of Columbia College, and he completely worked out the necessities from a dynamic standpoint; therefore, I know that the steel skeleton is more than sufficient to withstand every strain that will be put upon it." But the dentist is not doing that at all; he simply constructs whatever may be his momentary choice, puts it in and collects for it—perhaps. There has been practically little,



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if any, study of the dynamics nor indeed of the statics involved in dental bridgework. It has been a great pleasure for me to hear this paper in which the real dynamic problem in bridgework has been discussed in an intelligent and, I think you will all agree with me when I say, in a highly intelligent manner.

The mechanism described by the essayist is extremely ingenious, and it seems to be based upon considerable study of the dynamics involved, and I certainly hope that the solution is a good one. I am not sufficiently an expert to know positively whether it is or is not, and this is really more of a comment upon, than a discussion of, the paper.

I was also delighted to hear Dr. McCullough's remarks. They disclosed another student of the dynamics of bridgework.

Dr. Sanger. I have but little to add to what has already been said. I did not understand the paper itself without reference to the working model, and then I was able to understand quite well what the essayist intended, and I want to compliment him on his able presentation. He is somewhat of an orator as well as a writer, and certainly has entertained us very much. The underlying principle, however, is new, and yet it is not new. Undoubtedly he has produced something which holds itself in place, excepting as to an up-pull, and that is not new. Supplee, of New York, makes a bridge with a bar extending across the surface of the gum and a hook at the back end, and then the bridge, fitted over that, is locked to the hook at the back. That is not the same thing as the essayist showed us, but the principle is similar. Whether the method shown by the essayist will be permanent or not depends entirely upon the security of the anchorage, and each individual case must be treated by itself, so that after all it is merely another method rather than a new method of supporting the extension bridge.

Dr. Watkins. I desire to thank Dr. Chayes on behalf of this society for his beautiful paper. I think it is one of the finest we have ever had, and both the essayist and this society are to be congratulated. I followed its reading with very great interest, nor do I know when I have ever heard a paper which I listened to with such intense interest. The description I did not thoroughly understand, but the doctor is such a master of the situation that even though I did not comprehend it thoroughly, I could not help but enjoy it. (Applause.)

Dr. Chayes. I thank you very much for the manner in which this paper has been received, and I assure you I am most amply repaid for coming here and reading it. The first question raised by the discussion was regarding my objec-



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tion to root abutments. This objection was not because the root without a crown is weaker than a root with a crown, but because the surface for the adaptation of an abutment does not give sufficient contact surface for dependence. A root is just as strong without a crown as with one, provided there exists no pathological condition, but the area of contact surface for the cement is not there, and the strain comes at a point where contact surface is absolutely needed.

Concerning devitalization, I know Dr. McCullough's views differ from mine, and his method of crowning I am not ready to dispute, but I believe that the conservation of the work is better obtained by a complete hood instead of by just a pin. If he works on the principle of the lever he must admit that there will be a certain amount of wear and tear on that pin, and consequently, no matter how stiff it may be, there will be a certain amount of exposure of fine lines; in other words, a break between the pin and the tooth where it is left exposed at the occlusal surface of the tooth. Consequently his tooth will be exposed to greater wear and to disintegration quicker than mine will with a complete hood upon it. However, while I differ with Dr. McCullough in this particular respect, I give him all due honor for devising his method.

As to the question of increase of blood supply in case of devitalization, we have a tooth that stands alone. It becomes irritated under the force of mastication. It leans over to one side or the other, and there is a strain at the root extremity on the soft tissues. The pulp contains its arteries and nerve tissues. The pressure that exists on the nerve tissue causes a peridental irritation and in time a pericementitis. We know that the arteries that go to the pulp and to the pericementum come from the same source. Why will you dispute the fact then that upon the removal of the pulp the blood entering the pulp would be distributed to the peridental membrane, particularly as it is needed for sustenance, and nature is always bound to do her share in that respect wherever she can.

Concerning the question of leverage spoken of by Dr. McCullough, I disagree with him, because when I place my appliances on this bar and the stress is exerted by the upper tooth upon the lower one, only an amount of leverage is exercised upon that point in proportion to the amount of the rotary motion of the jaw. No amount of pressure will force the hood directly down upon the bar because the thirty-second of an inch was filed off therefrom. The place between the bellow-shaped split pin posteriorly and the U-shaped lateral was directly designed to take up this amount of rotary motion which is necessary to restore more or less of the tooth motion in the jaw.

Concerning devitalization I think that conservation should be used,



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particularly in younger cases, and those cases when they present themselves beyond the age of thirty-five, I think are in a condition where advantages arise from devitalization if the tooth is to be crowned, and crowned properly, in preference to exposing the patient to so much torture.

The first case that presented itself to me was that of a man about thirty-eight years of age who had a hard bite, and that case stands in his mouth to-day, with this exception, that due to the absorption of the alveolar ridge I found it necessary to put a film of wax on the saddle and revulcanize it.

The second case was for a lady who sent me a letter full of beautiful good wishes; she is mother superior to the Corpus Christi Monastery, and for nine years was in Brooklyn; she has a bi-lateral case in her mouth; she has only six of the lower teeth standing. I utilized the two canines, and because she was a woman who never left the interior of the convent, I did not think it necessary to cut off the tooth and put on white crowns, so I put on gold crowns. To this I attached my two bars and connected the two canines lingually with the bar of platinum and dropped it below the four incisors.

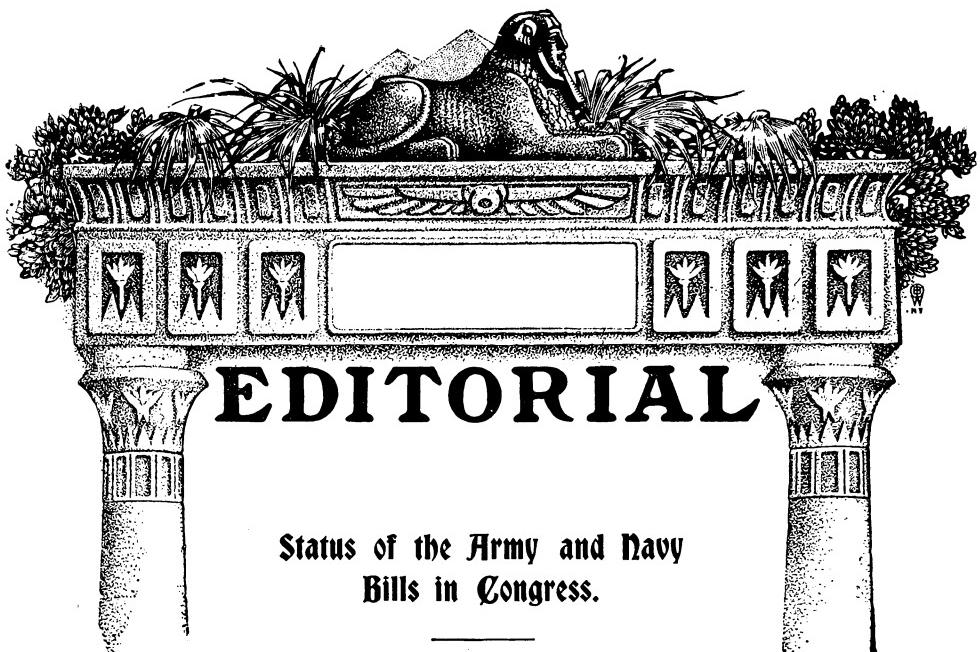
That lady told me—and I do not believe a mother superior ever lies—she had had a dozen plates made and could never wear them, and I put these devices into her mouth and she can chew hard apples. Do you know what it means to bite into a hard apple and be able to grind it for a woman who wears artificial teeth? It is a good deal.

That was my second case. I am not going to describe the eighteen cases that are in use. Five of them were bi-laterals and were connected lingually, and these cases have all given satisfaction, barring one. I have had one failure, and have learned more from it than from all the successful ones.

To Dr. Sanger I want to say that this is entirely different from the Supplee bridge which gives you the attachment to the bridge, and consequently you do have leverage upon it, while in this instance you do not.

On motion a vote of thanks to Dr. Chayes for his very excellent paper was adopted.

On motion adjourned.



EDITORIAL

Status of the Army and Navy Bills in Congress.

Our readers will be glad to know that for the first time in the history of the fight for dentists in the Army and Navy, a bill has passed one branch of Congress creating a dental corps for our sailor boys. On Wednesday, January 6, a bill entitled "H. R. 16620," authorizing the appointment of dental surgeons in the Navy, was passed in the House of Representatives, and on the following day was read twice in the Senate and referred to the Committee on Naval Affairs, where it now rests. All who have the slightest interest in this matter should write promptly to Senator Hale, or other members of the Senate Committee, urging an immediate favorable report. Although the bill is now in the Senate, its title remains as given above.

Discussion in the House. The discussion of this measure in the House of Representatives was of much interest, as shedding light upon the esteem in which dentists and dentistry is held. Mr. Dawson, in speaking for the bill, quoted at great length from a report made by the Surgeon General of the Navy, and it is pleasant to know that this prominent medical gentleman apparently fully appreciates the importance of dental services skilfully performed. In part his report follows:



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"Like the eyes, the teeth are coming properly to be regarded as intimately and widely associated with the various organs and functions of the body, and that defective teeth may be responsible for much ill health is recognized by all who keep in touch with the accumulating truths of medical science. The naval surgeon is alert to detect dental disorders early, lest an aggravation of them produce grave illness. He, however, has not that special knowledge required to fit him to cope with diseased teeth in a final manner. He can and often does put in temporary fillings and treats the medical and surgical complications incident to dental disorders and often extracts such teeth as are not worth preserving, but naval surgeons are not expected to deal with dental disorders in a radical manner. The practice of dentistry requires a special education and training.

"The teeth and the mouth are indubitably important factors in the causation of certain diseases of bacterial origin. This is not a hypothetical conclusion, for it has been proven beyond doubt that not only are bacteria found in great numbers in uncared for and neglected mouths, but their disease-producing properties are greatly increased, particularly in and about decayed teeth. Much of the tonsilitis and pharyngitis in the navy can undoubtedly be traced to bad teeth, as can also deranged digestion and general physical deterioration. In this connection it is not improbable that the teeth are an important contributory factor in tuberculosis by producing a state of lessened resistance to the disease by the constant absorption of poisonous matter.

"In thus indicating the prominent reasons for the Navy's need of proper dental services, it may be added that a bad tooth may occasionally give rise to serious complications which may even endanger life."

We have heard a great deal in the past about
Age Limit. the age limit for those entering the service of Uncle Sam as dental surgeons, and it certainly is pleasing to discover that there are some Congressmen who appreciate the fact that the limit should not be set too low. The following is quoted from the *Congressional Record's* report of the proceedings:

Mr. Gillespie. I would like to ask the gentleman a question.

Mr. Dawson. I will yield to the gentleman from Texas.

Mr. Gillespie. What is the maximum age limit for these dentists? I understood the reading of the bill to be 35 years.

Mr. Dawson. The age limit is 24 to 35 years.

Mr. Gillespie. What is the necessity of putting that limit so low as 35 years?

Mr. Dawson. This is a service where the members of it may be sent to sea, and we should have comparatively young men for the service.

Mr. Gillispie. I want to express my protest against the Oslerism contained in the bill, that a man over 35 years of age, although he possesses all the qualifications, mental and physical, and stands the examination, yet, because he is over 35 years of age, he shall be turned down.



Mr. Dawson. That is simply the entrance qualification, the gentleman should understand.

It is not necessary for a man to get out of the service when he reaches the age of 35. That is simply the age limit at entering.

Mr. Gillespie. That is what I am speaking of. I do not believe the entrance bars ought to be put up against him simply because he is over 35 years of age.

Mr. Dawson. I will state to the gentleman that, in my opinion, a dentist who has passed the age of 35 years and who is not receiving an income above that provided in this bill is not the kind of a dentist that we want in the Navy.

In reply to Mr. Dawson it may be pointed out that there is such a thing as patriotism even in the breasts of dentists. It is quite possible that the whole of the present dental corps now serving the Army could earn more money in civil life. Not a few gave up lucrative practices and entered the Army. Thus it is not the man who enters the Army or Navy because he can not earn as much elsewhere who will make the most desirable member of such a corps, but it is the man who has a special leaning toward military life, and who for that reason is willing to largely overlook the question of financial advantage in order to work in an environment harmonious with his predilections.

But while other members of the House also advocated an entrance age limit higher than thirty-five, no one advanced the most important reason for a high age limit for the Naval Corps. The age limit for entrance in all departments of the Army is low, because it is desired that men should not be retired with pensions after a comparatively short service. But it should be remembered that all other departments have long been established, and that they are therefore all in control and command of older and therefore more experienced men than could be obtained with an age limit as low as thirty-five. Moreover, the experiment has already been tried. The first Army dental corps was organized by men over thirty-five, men moreover who cheerfully abandoned lucrative practices to take up this work, and it is largely to this that the present efficiency of the dentist in the Army is traceable.

The passage of this naval bill in the House indicates that it is highly probable that the Army bill would likewise pass, if the Committee would report it favorably. The bill, known as Senate Bill 4432, has already passed the Senate. It has the united indorsement of the entire dental profession.



The chief of staff, Major General Bell, in his annual report says that the bill should pass, and it is known that many of the most influential members of the Military Committee of the House favor the bill. But time is passing; Congress will adjourn in a few weeks. It would seem a shame to have this bill die in committee. Let every man in dentistry who reads this appeal write, within twenty-four hours thereafter, to any member of the Committee that he may know, or who may be from his own State. And in any event, let every man write to at least one of the sub-committee on Army Organization urging the passage of the bill as it came from the Senate, that is to say, without amendment.

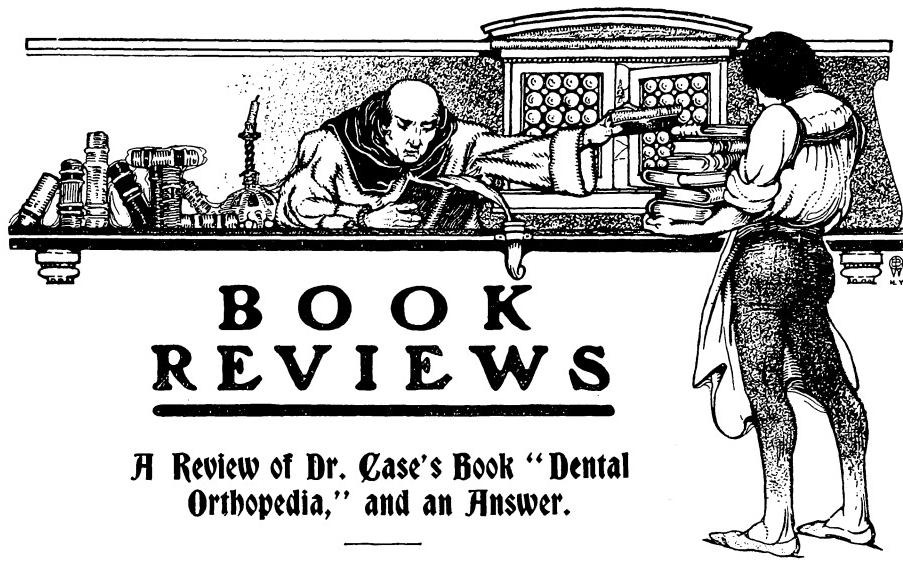
Committee on Military Affairs of the House.

60th CONGRESS.

John A. T. Hull, chairman, Iowa,	Frederick C. Stevens, Minnesota,
Richard Wayne Parker, New Jersey,	Daniel R. Anthony, Kansas,
Adin B. Capron, Rhode Island,	William Sulzer, New York,
George W. Prince, Illinois,	James Hay, Virginia,
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Sub-Committee on Army Organization.

A. T. Hull, Richard Wayne Parker, Adin B. Capron, Thos. W. Bradley, James L. Hay, James Sladen.



BOOK REVIEWS

A Review of Dr. Case's Book "Dental Orthopedia," and an Answer.

DENTAL ORTHOPEDIA; Including Drawings and Working Details of Appliances and Apparatus for all Forms of Irregularities of the Teeth. By Calvin S. Case, D.D.S., M.D. Published by the C. S. Case Company, Chicago, 1908,

The culmination of one's life work in the practice of orthodontia by the publication of a text-book, destined as this book is, to be helpful to the profession and to aid in the upbuilding of the science of orthodontia, is deserving of the highest praise, for many years of experience of the author can not fail to be of the greatest service to those who aim to master the difficulties of an art which has been unfolding its mysteries to the light of research down through the centuries so gradually, that, even to-day, the field of its future seems as dim as its past seemed obscure.

Far be it from me to belittle the effort of the author to raise the standard of orthodontia by this valuable contribution, and, were it not for the fact that a critical review is invited by the boldness of its tenets, and a defense demanded by those whom it attacks, the writer should prefer to lay down his pen.

The title of the work, "Dental Orthopedia," suggests something more than the mere dressing up of old mother "Orthodontia" in new clothes; it reveals the startling fact that the time has come when the correction of dental and maxillary deformities can no longer mask under the title "Straightening Crooked Teeth," since the involvement of the osseous structures of the maxillæ and mandible, and the wonderful pos-



sibility of their development, together with that of the whole internal and external face, demand that either the term orthodontia shall be more inclusive in its meaning, or else that a new term shall be given to the science which shall at least be comprehensive of its scope.

It is true that orthodontia means "straight tooth," and that orthopedia means "straight child," quoting the author, but it is also true that neither of them literally signifies the work of the orthodontist in the restoration of the normal dental, maxillary and mandibular arches, and the developmental influence upon the associated osseous structures and sinuses of the head.

It is somewhat difficult to establish a term which will exactly apply to the work of the orthodontist. "Dental Orthopedia" comes as near in its application as any, and yet its definition can only literally be the correction of dental deformities of children, unless the term is stretched. "Dental and Maxillary Orthopedia" is a little more comprehensive of the changes in dental and alveolar tissues through development of dental and maxillary arches, and yet it is open to the criticism of being too complex for ordinary use. Dento-facial Orthopedia is likewise comprehensive of the orthodontia field, especially when correction of facial deformities through correction of malocclusion is referred to, yet it also is a complex term.

However, these are all coined terms, and their establishment in general usage by the profession will depend somewhat on their favor. Orthodontia, as the mother science, will still continue to be used, until its restricted application is more generally understood and appreciated.

The book in the main, outside of the chapters devoted strictly to technic descriptions and treatment, contains so many chapters of unfavorable criticism of "new school" methods that the reader gains the impression that it is a controversial volume, and is a little inclined to question the justness of the severity of the attacks which the author makes upon the theory and practice of the "new school."

The writer would criticize this method of bookmaking inasmuch as a treatise on any science ought to present the author's point of view and should stand on its own merits, to be accepted or discarded by the reader according to his judgment of its relative value, leaving the controversy for the essay to be discussed pro and con by others in the dental meeting. Already several years have elapsed since the essays, of which these controversial chapters consist, were published. It is possible that the "new school" may have progressed in the meantime or may in the near future to such a degree that this series of attacks upon them may not apply in the way that the author intended, and the future student may not be interested in an historical controversy which does not concern his present need for intellectual advancement.



Dr. Case remarks on page viii of the preface, "I have aimed to teach only that which has been practically applied in my own practice."

Already too many text-books on orthodontia have been given to the profession which so purposely belittled or ignored the work of others in the same field that they savored very strongly of the one man system. Perhaps the greatest fault of Dr. Case's book lies in its being too original, showing very little effect of the influence of others in the same field of practice, and for that reason being narrow rather than broad in the generality of its teachings.

It is unfortunate that a work on science, such as orthodontia or dental orthopedia, should not include much that is of value from the writings of others in order to truly represent the scientific advancement, rather than that each new text-book on the subject should so ignore the works of others in its text that the method presented should have the appearance of a one-man system, entirely original with the author.

Dr. Case's text-book is plainly of this type, the work dealing entirely with the methods of the author, and acknowledging little of contemporary value among others who may have discovered new methods of great value to the science, which should be naturally recognized and credited in a text-book, by an author unbiased in his judgment, and aiming to advance the science by the acknowledgment and application of such new methods as from time to time may be originated by a modest and less well-known contemporary in the field.

To illustrate, the method of arch predetermination, brought out in 1904 by Dr. Hawley, and accredited by the foremost men of this country and Europe as being of inestimable value in the advancement of the science of orthodontia, is not so much as mentioned by Dr. Case, and the writer must infer, therefore, that it is not appreciated.

For four years this method of Dr. Hawley's has been before the profession, its value attested by practical every-day experience of the "new school" men, or at least by the members of the American Society of Orthodontists, and yet a text-book on orthodontia appearing in 1908 gives it absolutely no mention.

It is to be regretted that a book which purports to be a scientific treatise on so important a subject as dental orthopedia should be handicapped by so much of the dental catalogue as appears in its pages.

While it is possibly true that the general practitioner can not make many of the complicated appliances illustrated, and must, therefore, order them from the author, it would seem more in keeping with the dignity of the work if the commercial listing of appliances was included in a separate orthodontia catalogue.



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Again, the arrangement of the chapters in the book is faulty in view of the sequence suggested by a consideration of the subject in the chronological order in use in the best text-books on diseases or deformities in general medicine, such as a treatise on tumors, in which the beginning chapters described the morphological, the macroscopical and microscopical anatomy, following the order of etiology, diagnosis, prognosis and treatment. The consideration of stock, material and appliances in the first chapter of Dr. Case's book is as out of place as would be the descriptions of knives and catgut ligatures in the first chapter of a treatise on tumors before the reader gains any idea of what a tumor consists of, its etiological or diagnostic manifestations. Such an arrangement of the subject as Dr. Case's work presents, places undue emphasis upon the appliances and the instruments for their construction and manipulation, which, however, is probably intended by the author.

In Chapter I the author places himself on record regarding the qualities of German silver as compared with the alloys of gold as follows: "It possesses all of the requisite qualities of gold and its

alloys for the temporary purpose of the appliances, except that of appearance, and even this may be overcome by a skilful construction, high finish and heavy gold plating, followed by keeping the appliances clean and polished." It is odd that the author should have chosen as an exception a harmless quality of German silver which is much less important than almost any other, the "appearance" of German silver appliances being not nearly so momentous a consideration as the discoloration of tooth surfaces and the formation of deleterious salts of copper through the use of this material, two disadvantages which do not occur in the use of the gold alloys in the mouth.

"One of its great advantages over gold," says the author, "lies in the fact that the dentists are more willing to remove and throw away German silver appliances as soon as they have outgrown their usefulness and exchange them for others which are more perfectly adapted to meet the demands of changed conditions." Again, the author is unfortunate in selecting the weakest argument in favor of German silver, for the very fact that the dentist is compelled to throw away a German silver appliance is one of its greatest disadvantages as compared with a gold appliance, which is never thrown away. To illustrate, money invested in a German silver appliance is in the end totally lost in the destruction of the appliance; the same money invested in a gold appliance is two-thirds or three-quarters saved in the "gold scrap." An investment of \$500 a year in German silver appliances means a loss of \$500, and an investment of \$500 in gold appliances means a saving of \$300 or \$400.



Further, German silver is attacked by the fluids of the mouth; gold is unaffected by any of the oral secretions. German silver will lose its temper by heating in the blowpipe flame; a proper alloy of gold with some of the other noble metals is unaffected in temper by the flame of the ordinary blowpipe, preserving a permanent temper under all conditions.

It has also been shown that the gold plating of a German silver appliance is even more undesirable than the plain German silver appliance, since the two metals in the gold plated wires and bands form an electric battery by means of the electrolytic action of which the disintegration of German silver is very much more rapid than the unplated German silver.

New Forms of Appliances.

There are introduced in Chapter II a number of new appliances, some of which undoubtedly possess merit. The ribbon attachment pull bar (page 27), the new forms of arc and drop jacks (page 29) and the turnbuckle jack (page 30) appeal to the writer as being of some use in special cases in which it may be desirable to use a powerful appliance with the screw principle. The writer does not believe in their too common use nor in the necessity for their application as illustrated throughout the book.

Impressions and Casts.

The writer is somewhat surprised at the stand the author of the work takes upon the quality of impression materials. In Chapter III, page 31, it is stated that "Absolute duplication of the parts, as required for artificial dentures and which may be obtained from plaster impressions, is rarely, if ever demanded. In fact, the slight difference, if any, between dental casts made from skilfully taken modeling compound impressions and those taken with plaster, is quite immaterial for all purposes of study and use, nor is it always advisable to attempt so trying an ordeal as a plaster impression at the first sitting with many nervous children and youths."

"In the author's teaching, competent and successful diagnosis can only be accomplished at the chair, where the natural occlusion of the teeth, and the influences which the teeth and alveolar processes exert in characterizing the facial outlines, may be carefully and intelligently studied in all their phases of malrelation."

The writer regrets the author's use of modeling compound as a deviation from accuracy (likewise noted in the indefinite directions for trimming the cast on page 33), which is hardly consistent with the exactness of detail characterizing many of the methods described in other parts of the work.

The casts made from compound impressions by a very careful operator may not vary considerably from a general resemblance to the natural



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teeth and alveolar arches which they are intended to reproduce, but compound will not copy the forms of arches and teeth nor their surfaces with any degree of accuracy, and the same method in the hands of the average general practitioner of dentistry may prove to be so devoid of accuracy that even tooth forms can scarcely be recognized; in fact, some of the casts made from compound impressions and sent in to the orthodontia specialists for consultation represent more truly a reproduction of the mouths of some extinct species of the lower animals.

On page 127 Dr. Case states that "*Occlusion* is one of the most important factors for consideration in diagnosis and prognosis." If this be true, should not the most accurate methods be used for securing perfect reproductions of the dental arches, such as are obtained from plaster impressions? Surely, the accurate interdigitation of the tooth cusps, the facets of articulating surfaces, the rugæ and stippling of the gums, the form and attachment of the frenum labium, external indications of abscesses and other pathological conditions such as hypertrophy of gum tissue and pyorrhea, are important enough in diagnosis and prognosis to demand an exact copying material, none of these details being accurately recorded in the cast made from the compound impression.

As to plaster impressions being a "trying ordeal," an average amount of skill in the use of this material removes all occasion for alarm or nervous apprehension on the part of the younger patients, but here, also, the same suggestive method of handling the patient may be followed when necessary, as is described in the book under the taking of the facial impressions in plaster, where it is more obviously needed.

Diagnosis at the chair is, of course, a necessity, but it does not imply that an inaccurate model should be the guide in the patient's absence.

How can accurate measurements be made from casts made from compound impressions in the predetermination of the arch by the Hawley method, when the mesio-distal diameters of the incisors and cuspids must needs be exact enough to record a variation of one-hundredth of an inch in order to determine the size to which undeveloped dental arches in malocclusion should be made to conform through treatment?

Again, the developmental changes in alveolar tissues, such as the filling out of depressed zones, and the alteration of the angles of inclination of the teeth, as well as the finer changes in occlusal relations, can only be perfectly recorded in casts made from plaster impressions.

Finally, in retention, the indications for the proper relations of retaining appliances can only be observed in a perfect plaster reproduction of the teeth in which the labial, buccal and lingual aspects of the dental and maxillary arches are accurately reproduced.



There is hardly a single illustration of a model in Dr. Case's book in which can be seen the actual tooth movements accomplished or the alveolar changes made as a result of treatment, the casts in every instance being secondary in importance to the accompanying accurately illustrated facemasks, which, although important in many ways, do not tell the whole story by any means.

New Instruments. In Chapters IV and V, on the general and detailed construction of regulating bands, are described and illustrated many different forms of plain bands with their attachments and various ingenious instruments for their construction and adaptation. The screw clamp band, which is in special favor with the "new school" operators, is not included in these descriptions, the author preferring a cemented plain band for all molar anchorages as is evident from the illustrations.

Orthodontists have been handicapped somewhat by a paucity of well-made instruments especially adapted for operative work. The whole field of instrumentation in orthodontia has been covered by Dr. Case, a series of very perfect instruments having been devised by him, especially adaptable for work within the mouth, such as wire bending and cutting pliers, band slitting and removing pliers, *et al.*, described in different chapters throughout the work.

**Principles
of Mechanics.** Of especial importance to the student of orthodontia or dental orthopedia is the chapter on "Principles of Mechanics in Moving Teeth," beginning on page 67. The descriptions of the different kinds of levers, and their application for the primary movements of teeth, designated by the author as "inclination, rotating, bodily, extruding and intruding," together with the carefully chosen illustrations, present the subject in such a forceful manner that it can not fail of appreciation.

Perhaps in no other way is Dr. Case's work unique than in the descriptions of methods for the bodily movement of the teeth. As far back as 1893 these methods were first published by the author, since which time their application in his practice has been somewhat improved, and some very ingenious combinations of appliances therefor are illustrated in the book. The reader gains the idea that the bodily movement of the anterior teeth backward or forward in protrusion cases is necessary in the majority of cases, which is a mistake, only a small percentage of this class of cases requiring such treatment.

The greatest need for bodily movement of the teeth is in the lateral movement of bicuspids and molars, especially during the earlier period of their development, since during this stage the greatest opportunity for development of associated structures of the internal face is possible,



and the lateral bodily movement of the bicuspids and molars affords the best stimulus to the lateral widening and development of the dental and maxillary arches.

**Controversies with
the New School.**

From the persistency with which Dr. Case attacks the "new school" methods throughout the work, it is evident to the reader that a personal embitterment toward some of the "new school" men has prejudiced him against anything good which they might originate. This bias on the author's part has led to some inconsistencies in the work, as will be later shown. The book, in a large degree, may be styled a controversial work, in which the disputes of the claims of others and the priority and perfection of the author's methods are all too frequently encountered. A scientific work ought to present a theory which should be allowed to stand upon its own merits before the reader without the interjection of the controversy in regard to the methods of others, which might better be left to the essay where it is permissible, but not even there with the personal equation entering into it.

The indulging in personal ridicule of other operators in the same field in a text-book claiming to be scientific, is not accepted as argument by the earnest and conscientious student of orthodontia literature, especially when the chief arguments are sidetracked, as it were, in order that the reader's attention may be focused upon the shortcomings of others. One might suspect something of design on the part of a writer who thus sidetracks his arguments for censure, in that the argument itself being weak, the reader's attention must be detracted from the argument to the author's skilful handling of the weapon of ridicule, a sort of mental suggestiveness which does not exert a special hypnotic effect upon the intelligent reader.

In no way does Dr. Case credit the "new school" with any degree of advancement, even descending to ridiculing their most praiseworthy efforts. Such phrases as "men of limited experience," "misguided operators," "the awakened ones," "the non-extractionists," "our learned (?) critic," and others of a similar nature serve to show the respect which the author has for the "new school" men and their teachings.

If the reader will compare for a moment the teachings of the "new school" and some of Dr. Case's affirmations, he will see that Dr. Case practically agrees with the "new school" principles in certain parts of his work, while in others he inconsistently denounces the same principles.

Beginning with page 130 Dr. Case takes up the teaching of the "new school," and attempts to prove that "in its principal mandates it is false teaching," and further says, "which, if indulged in by any considerable portion of the profession, it cannot help but retard the science of orthopedic dentistry."



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What are the "principal mandates" of the "new school"? The first one is that "occlusion is the basis of the science of orthodontia" (Angle, "Malocclusion of the Teeth," page 1). On page 109 of Dr. Case's work, he inviolably commits himself to this doctrine as follows: "The foundation of all training calculated to fit one to enter the practical field of orthopedic dentistry must lie in a perfect knowledge of Nature's *anatomical arrangement* and *occlusion* of the teeth, and the form and structure of the *alveolar process*." The author places himself in hearty accord with the principles of occlusion in his republication in Chapter X, of the section from Dr. Black's work on "Dental Anatomy."

The "new school" teaches that normal occlusion is the ideal in occlusal relations of the teeth, and that its restoration in all cases, when possible, is ideal treatment. Dr. Case agrees with this, for on page 127 he says, "Therefore, in all of these cases, however jumbled the irregularity, the rule should be *imperative* that we strive to produce a *typically normal occlusion*."

The "new school" teaches that the first permanent molars are the keys to occlusion and classification of malocclusion. Dr. Case again affirms, "He (Angle) places the occlusal relations of the first permanent molars as the real guide posts in diagnosis for determining the general relations of occlusion. This should meet with the hearty approval of all experienced orthodontists."

The "new school" teaches that extraction is a wrong principle, and should not be resorted to when the restoration of the normal in occlusion is impossible, or where a facial imperfection might result. Dr. Case remarks on page 149, "The only excuse, then, for the extraction of savable teeth must be that it is inexpedient to correct their positions in that way without producing a facial protrusion."

In these several points the "new school" teachings and those of Dr. Case are apparently not inharmonious, and as these points cover the "principal mandates" of the "new school," the denunciation of them as "false teachings" seems somewhat inconsistent.

On page 132 of Dr. Case's book, he says, referring to the restoration of normal occlusion, "it has been such a *self-evident principle* in the regulation and retention of teeth, it seemed almost out of place to ring changes upon it." After expressing again his belief in the principle, it hardly seems consistent with this conviction to illustrate before and after treatment cases in occlusion of such infinitesimal size that the result of the occlusal restoration can not be definitely determined in a single instance in the entire book. The writer fails to find that the number of results obtained without extraction, illustrated in the book, is sufficient



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to credit the author with any deep conviction as to the importance of the principle of restoration of normal occlusion.

On page 93 the author states, "In all disto-mesial malrelations these misguided operators apply the intermaxillary force with a view to reciprocal movement of the upper and lower teeth." As he is referring to the "new school" operators, it might be well to quote from an article published by the writer in 1905,* showing that the "new school" men believe in an intelligent use of the intermaxillary force as follows: "The use of the rubber ligature has been applied by the 'new school' as a reciprocating force only in so far as the physical and mechanical characteristics present will allow, and the requirements of the case in which it is applied will demand. The following are many of the uses to which the 'Baker anchorage' is adapted in treatment of malocclusion:

"The use of either arch in phalanx as anchorage for the attachment of the rubber ligature to resist a movement of one or two or more teeth in the opposite arch, for which a greater resistance is needed than reciprocation of anchorage.

"The upper arch used in phalanx as resistance for the consecutive movement of the lower anterior and buccal teeth when the ligature is applied especially for this movement.

"The lower arch used in phalanx as resistance for the consecutive movement of the upper molars, bicuspids, cuspids and incisors, when the rubber ligature is applied especially for this movement.

"Its use as an auxiliary to any mesial or distal movement of one or more teeth.

"An equally reciprocal movement is not claimed in any of these cases, though it may be and is accomplished in some cases by proper manipulation of appliances so as to restrict the action of the rubber ligatures in one arch or the other, as the case demands. An exactly equal reciprocating movement of the upper and lower teeth is not obtained by an unrestrained action of the rubber ligature in any case. As pointed out by Dr. Ottolengui in his editorial on an article of Dr. Case's, 'in order to achieve exactly equal reciprocal movement between two objects bound together by an elastic, it is absolutely requisite that the two objects shall be equally stationary, and, therefore, equally easily moved.'

The restatement of the uses of the intermaxillary anchorage is included under the heading "Dynamics and Anchorage," page 579, in the writer's section on orthodontia in Dr. Johnson's "Operative Dentistry."

Treatment. Beginning with Chapter XVII, the treatment of "simple and complex irregularities," with the drawings and descriptions of appliances to be used,

* "Normal Occlusion vs. Normal Dental Relation," read before American Society of Orthodontists, Chicago, Ill., September 28, 1905.



is continued throughout six chapters of Part IV, in which the idea of simplicity of appliance construction seems to have been forgotten. Indeed, the title might better serve if it were changed to "Complicated Treatment of Simple Irregularities."

It will be observed in most of the drawings of appliances that in comparison with the use of a simple expansion arch, for securing arch "alignment," the appliances are all complicated, and in some instances, contrary to the proper handling of force and resistance in the dental arches.

For an example of this complication in appliances, the apparatus shown in the drawing, Fig. 12, is a fair sample. The requirements for this case are the lateral expansion of the upper arch, at the same time making space for the alignment of the labially erupted central incisor. The appliances directed to be used are bands upon cuspids and molars, lingual bars connecting the cuspid and molar bands on each side, and a jackscrew crossing the arch in the cuspid region, engaging the lingual bars; next, another jackscrew placed between the lateral and central, attached to plain bands, for opening the space for the labially erupted central; finally, buccal tubes upon the molar bands provide for an alignment bow, if needed. Here are three different force-producing appliances in use where a single expansion arch is sufficient for all the requirements.

We will grant that the jackscrew is an efficient auxiliary in its many modifications, but it can not be substituted for the expansion arch as a universal appliance for arch expansion and alignment.

What is the value of teaching methods that are antiquated because of their complications? The student can not gain by them, and if he follows them he may never get out of the rut which such teachings force him into.

Continuing throughout the six chapters the same complications in treatment with various modifications are described, the drawings (Fig. 20, page 210), showing one, two and even three jackscrews on the lingual side of the arch where they greatly interfere with speech and mastication.

In almost every case described the alignment bow, which is applied for a different purpose than the expansion arch, namely, as a backstop for all the lingually applied forces, is ultimately used.

In Fig. 21, page 210, the nearest approach to the proper use of the expansion arch is illustrated, one lateral incisor being ligated with wire, and the other lateral attached with the Matteson attachment to the expansion arch for their restoration to normal positions, but the author gives the expansion arch a secondary place as an appliance for effecting these movements in the text as follows: "Both of these methods, how-



ever, give far more pain in their treatment adjustments than the positive force of a screw which is always sure, comparatively painless, and, therefore, to be preferred in the alignment of all *extensive* contrusions, and especially for inlocked upper incisors."

There is no doubt that the force of the jackscrew is positive, especially when placed across the dental arch, but except in exceedingly undeveloped narrow adult arches where the maximum of force is sometimes required, the buccal expansion arch is positive enough for all needs of tooth movement, and, if carefully adjusted and used, the question of pain does not enter into consideration. For the simple operation of restoring inlocked laterals to alignment, the expansion arch is far superior to the lingual jackscrews because it first provides space, then power to move the laterals to alignment through ligatures, and finally, alignment of all of the teeth of the arch, which is always necessary in these cases.

Chapter XIX presents many different methods of rotating teeth, some of which are valuable, others of questionable value. The use of the lever and ligatures of wire or silk are usually more effective than any other method of rotating teeth. The author's criticism of the wire ligature for rotating teeth seems to be unnecessary, except as caution for the novice. Silk ligatures occupy the same position in the interproximate spaces as do the wire ligatures, yet the author has not stated in the use of silk that a "whirlwind of pyorrhea" cases will ensue, as he claims, will be the least dangerous thing that may happen with the use of the wire ligature. The same care in adjusting the wire ligature which is used in the adjustment of the silk ligature will avoid any of the dangers which the author has pointed out as sure to happen. It is strange that any method of operating which is endorsed by the "new school" is denounced in Dr. Case's work in some portion of the text. The wire ligature was introduced by Dr. Angle, and has been used by the "new school" operators almost exclusively, the silk ligature being the only exception.

The writer cannot endorse methods of rotation which involve the use of the jackscrew across the dental arch as in Ap. 28, 30, 31 and 32, pages 216 and 220, except in a few special cases. The wire ligatures attached from the spurred band to the "alignment bow," in Ap. 34, page 220, appeals to the writer as far more effective and certainly more comfortable than the reciprocating jacks across the dental arch.

In Chapter XX on "Contracted and Expanded Arches," the continued use of the jackscrew across the dental arch is shown for expansion and contraction in preference to the expansion arch, which, although the author says on page 277, "it is therefore hoped that the author will not be understood as discrediting the usefulness of the arch bow, or what Dr. Angle has named the 'expansion arch,'" the very impression is con-

veyed which the author apparently does not intend. In a close study of the text and illustrations, the expansion arch, supported by buccal tubes on molar bands, with nuts in front of these tubes, is not shown in this chapter, nor is it fairly described or illustrated in the section including Ap. 21, page 210, the only case shown in the apparatus of Group II to which the reader is referred.

The only special need which the writer can see for the use of the arc jack, the turnbuckle jack, *et al.*, is in cases of adult arches where only the most powerful screw pressure directly applied will accomplish tooth movement. In this class of cases the expansion arch is comparatively slow in action, although if of large enough gauge and strong spring temper, even the most obstinate cases of narrow arches may be expanded.

A very interesting and instructive chapter is

Impacted Teeth. that designated "Impacted Teeth and Their Treatment," Chapter XXII. The etiology, diagnosis with

the X-ray, and the treatment of impacted teeth are here described in a more thorough manner than has heretofore been attempted by any other author. On pages 248 and 249 of this chapter, Dr. Case again expresses his disbelief in the advisability of shifting the occlusion of the lower teeth distally "half the width of a cusp" in children of eight or nine years for fear of a later impaction of the third molar. It would seem that this is a needless caution for the experienced orthodontist who usually takes into consideration just such possibilities. However, the writer believes that with a very gradual application of the intermaxillary force for shifting the occlusion in these (Class III) cases, Nature is stimulated to develop the alveolar tissues in the right direction before any radical change in the second molar has taken place. In other words, if the shifting of the occlusion seems to be unusually difficult, and any undue backward tipping of the unerupted second molar foreseen, the treatment may be undertaken with such intervals of rest and retention as will insure the normal eruption of the second molar, and later, the third molar. This stimulus to attainment of normal occlusal relations is no doubt beneficial in producing the normal but retarded physiological development of the alveolar arches, which will allow of *more*, rather than *less*, room for the later normal eruption of the third molar. A case in the writer's practice of a seventeen-year-old girl, who erupted her third molars during the wearing of intermaxillary elastics for treatment of a mesial occlusion of the lower arch with no harmful results, will extend a little encouragement to those who may fear to undertake these cases because of the possibility of interfering with the natural eruption of the third molars. (See ITEMS OF INTEREST, August, 1905, page 598, Fig. 38.)

In Chapter XV, and in consecutive chapters

Diagnosis. from XXIII to XL, the principles, diagnosis and treatment of what the author terms "dento-facial irregularities" are discussed. Dr. Case believes that correct diagnosis of dental deformities can only be made from a study of the facial contour, upon which his classification and treatment is based.

He ignores the three-class scheme of Angle, without any regard to its merits, and substitutes a seven-class scheme, which, from indications at the present writing, is not liable to be generally accepted. It might be admitted that the Angle classification does not provide for the possibility of the upper arch being protruded or retruded in relation to the rest of the structures of the head, with the lower arch normal or protruded or retruded in relation to the rest of the structures of the head at the same time, but neither does the Case classification provide for the mesio-distal variation in malocclusion which is the all-important scheme in the Angle classification, which has done more to place diagnosis and treatment on an intelligent working basis than anything else.

Bimaxillary protrusions and retrusions are very rare in practice and ought not to receive the important place in a classification that the common types of deformities do. Again a classification of malocclusion is intended primarily for the purpose of diagnosis of variations from the normal in the occlusal relations of the teeth, therefore a classification based upon this variation from normal occlusion ought to indicate, as the three-class scheme does, the necessary tooth movements for the restoration of their normal positions.

On page 129 Dr. Case affirms: "The first permanent molars are the true basis of their respective dental arches, the relative antero-posterior positions of which are largely influenced by the relative mesio-distal positions which these teeth assume in the jaws." This statement does not sound consistent for one who does not believe in a classification according to the mesio-distal variation from the normal occlusion of the dental arches, of which the first molars are the keys.

Grant that Dr. Case may be right: that there are enough cases of protrusions of the upper arch with retrusion of the lower in relation to the rest of the head or to the profile, so that they should be included in a classification, it still remains possible to include these cases in a classification based upon the mesio-distal variations from normal occlusion, for they are as much mesio-distal variations from the normal as the cases of Classes II and III of the Angle classification.

The questions of diagnosis of malocclusion from the profile *vs.* diagnosis of malocclusion from the teeth are still vital issues between "new



school" teachings and those of Dr. Case, and for the same reason that the classifications of malocclusion are at variance.

In 1905 the writer answered some of the arguments brought up by Dr. Case to prove that diagnosis from the profile was the only correct method of determining the underlying malocclusion. In a paper entitled "Normal Occlusion *vs.* Normal Dental Relation," the writer made the following statements: "In other branches of orthopedic surgery the morphological anatomy of the overlying soft tissues is not considered as essential and primary a diagnostic feature as the deformed structure of the underlying osseous structures, *e. g.*, curvature of the spine and club-foot are diagnosed from a primary discernment of the abnormality of the bony tissues underneath. A restoration of the symmetry of the overlying soft tissues can only be accomplished by a restoration of the normal form and position of the osseous structures underneath."

"For the same reason, therefore, the facial lines are dependent upon the osseous structures of the face, the formation and relative positions of maxilla and mandible, and the teeth and their processes, for their harmony or inharmony of form, and a reversal of this natural order of etiological characteristics would be an absurdity.

"Consequently faulty facial lines should be regarded as symptoms rather than causes of an existing deformity of the osseous structures underneath."

In the chapter entitled "The Question of Extraction in Orthodontia," the author again essays to prove that the "new school" theories and practices are altogether wrong, exhibiting the unfair evidences of beautifully illustrated facemasks alongside of infinitesimal casts of the same cases. An examination of the actual casts of these cases in occlusion would enable the orthodontist to tell from his own experience whether it were possible to treat the case without extraction. However, from the evidence of the facemasks submitted, the writer does not hesitate to say that better results in facial contour would have been obtained without extraction in those cases in which Dr. Case extracted, provided that the cases would respond to treatment.

Added observation and experience of "new school" operators seem to prove that their theory is correct, not only is the facial profile improved by preservation of all of the teeth whenever possible, but arch integrity through the full complement of teeth being preserved means better retention and better mastication; in fact, the restoration of perfect function of the arches of teeth which the loss of but a single tooth will absolutely destroy.



The principles of retention are very thoroughly treated in Chapter XLVIII, the many reactive influences being fully and ably described, the author's experience enabling him to present in concise form the results of many years of valuable observation and practice.

Retention.

In the next two chapters dealing with retaining fixtures, the same thoroughness of detail has characterized the descriptions and illustrations of appliances which have proven successful in the author's practice is exhibited. Nearly every retaining appliance for the anterior teeth exhibits the T extensions between the incisors and cuspids. While these extensions are very esthetic, there is the necessity for frequent examinations in order that the washing out of the cement from under these partial bands may not allow of the retention of food detritus for any length of time without a removal and recementing of the appliance. For this reason the plain band is to be preferred where it can be used, although there is undoubtedly a field of operations where the T extensions will serve a purpose.

The retention of the deciduous arch is not described, as would not be expected in a work dealing entirely with the treatment of malocclusion of the second dentition.

Methods of retaining the correct overbite, such as lingual inclined planes, *et al.*, are not included in this chapter.

Of special importance to the orthodontia specialist to-day are some subjects which are not treated in Dr. Case's book, one in particular: the development by orthopedic means of the deciduous dental arch.

To this line of treatment the "new school" men are devoting their best energies at the present time. Children from four to nine years of age are the usual patients, the adult seldom being seen in their offices. This means that the "new school" are inaugurating a new era of preventive treatment, as it were, in orthodontia, completing their cases at an age when the "old school" operators usually begin.

The experience of the "old school" operators is peculiarly valuable, that of Dr. Case exceptionally so, in that, through his specializing in dental orthopedia for many years, he has been enabled to materially advance the science by his contributions to its theory and methodology.

It is peculiarly unfortunate that the line was ever drawn between the "old school" and the "new school" operators, in such a way as to offend the followers of the "old school" methods and to create antagonism among the leaders of a science which could gain most from a blending of old and new ideas rather than from their complete separation. It has rendered good fellowship and united progress, in which the "new school" might benefit by the experience of the "old school," and the latter profit



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by the investigations of the "new school," rather distant acquaintances of the members of both the old and the new schools.

The writer uses the term "new school," meaning no offense to the pioneers in orthodontia. Were it not for them there would be no orthodontia of to-day, and many of the principles which they have established will remain established until the end of time, useful to every succeeding generation of orthodontists.

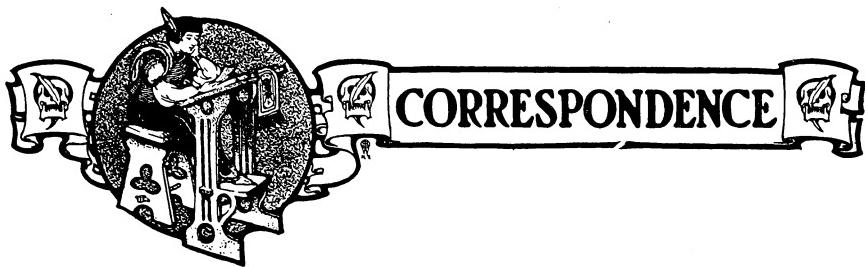
And so, also, the work of the "new school" in its relation to the teachings of a text-book such as Dr. Case's must be vital to the present time, and, therefore it is that I believe that "new school" teaching is of such value as to be necessary to the completion of any of the text-books of the older writers on orthodontia.

This review and answer is not intended to prove that the author is wholly wrong in his deductions, and the "new school" entirely right in theirs. The happy balance between the teachings of both would probably represent the ideal in theory and practice which it is eminently desirous should be taught. The teaching of Dr. Case is incomplete without the modifications of "new school" thought, and the latter is incomplete without an acknowledgment of and inclusion of much that is of value in the work of the author.

Dr. Case's work may be considered as the finest interpretation of the "old school" methods that has been published, and while the writer cannot endorse the theory and methods in general in the book, since they are opposed to those which the "new school" honestly believe to be correct, yet there is much contained in the book which is valuable and essential to the proper teaching of orthodontia or dental orthopedia.

H. A. P.





Reorganization of the National Dental Association.

My Dear Doctor:

In reply to a request that opinions of members of the Massachusetts Dental Society might be expressed in regard to the reorganization of the National Dental Association, I would like to emphasize again the same ideas I expressed in my address as president of the Massachusetts State Society at its meeting in June, 1908, and which was published in the September *Allied Journal*, Vol. 3.

It is well known that the National Association has done much excellent work in the past, but the present is an age of progress, and if the best results are to be obtained in the future, and the dental profession is to derive the greatest possible good from its existence, the time has arrived for a new departure in its methods and organization.

The comparatively small percentage of dentists in this country who are at present members of that organization indicates plainly that it is not fulfilling to the highest degree its purpose as an association, nor keeping in touch as it should with the dental fraternity in general.

With the large increase in its membership that might result from a reorganization of the association, its influence for good might become more far reaching and especially in securing proper legislation on matters of vital importance to the profession and to the public, while the increase of fraternal feeling among the dentists of the country would tend to the further elevation of the profession.

Other professions have set the example and are to-day reaping the rewards of their timely efforts in the way of reorganization. The recent success of the Chemical Society, as outlined in a letter recently received from its secretary, is a noteworthy example.

But above all the medical association has achieved the most pronounced success by such action, and it would seem that any action taken by the dental fraternity should be along similar lines.

The publication of a journal by the National Association would be



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of far reaching benefit to the fraternity and should be entered upon as soon as practicable, and there can be no doubt that it would have adequate financial support.

The journal of the American Medical Association has been a great success and stands first in importance of all the medical magazines published on this continent, and there can be little doubt that a similar publication in the interests of dentistry would succeed equally well. Considering the great fame which American dentists have won abroad, is it not likely that a publication of this kind might achieve a like reputation? This may seem a trifle optimistic, but we believe it is possible.

The dental profession needs stimulation if it is to make progress, and the forward movement should begin without unnecessary delay. The publication of a journal would give increased opportunities for the interchange of ideas, and would keep the members well informed in relation to matters of interest to the profession.

What is needed to-day among the dental fraternity is co-operation, and a realization of the fact that in union there is strength. If the 36,000 dentists of this country will only become interested in this movement, and lend it such support as they very well can afford, American dentistry, which now leads the world, can be raised to a yet much higher level. As a profession we must certainly either progress or retrograde.

By a wise and systematic reorganization of the National Association and by broadening the scope of its work, we can make it worthy of its name. In my opinion New England will give such a movement hearty support, and it will have a tendency to increase the membership in the different State societies.

I wish to call attention to an editorial in the *Dental Cosmos*, of October, 1908, which is on very broad lines, and which should be read by every member of the profession.

In conclusion, I would say that I believe that your plan for reorganization on lines similar to those of the American Medical Association is a movement in the right direction, but that a matter of such great importance should receive much careful consideration before the final steps are taken.

Yours very truly, GEORGE E. SAVAGE.

The following is the letter from the secretary of the American Chemical Society mentioned above:

DR. G. E. SAVAGE, Worcester, Mass.

My Dear DR. SAVAGE:

Dr. Merigold, of your city, has just written me asking me to give you some details in regard to the American Chemical Society. I judge from what he writes that you wish simply a general statement of our affairs.



The American Chemical Society has grown with great rapidity in recent years and is now the second largest chemical society in the world. Some fifteen years ago it was a small society of local character with a membership almost wholly in and around New York City, and it had been struggling since 1877 to keep up its journals and to get increasing influence.

It was finally decided to form local sections throughout the United States, and several other small chemical societies in the country were induced to join with it in the publication of its journal; and arrangements were made whereby the *Journal of Analytical and Applied Chemistry* was also taken over. The society grew somewhat under these conditions, but the fact that we had members and associate members seemed to mitigate against our success. It was finally concluded to give up the grade of associate member and to admit all persons who were enough interested in chemistry to secure the endorsement of three of our members and pay our annual dues.

We were then publishing only one journal. Just two years ago we tried to arrange with the Society of Chemical Industry and the Chemical Society of London for a combination of effort in regard to the publishing of abstracts of chemistry, but were unable to do so. Finally we decided to take the financial risk involved ourselves, and to publish a new journal called *Chemical Abstracts*. This journal has been eminently successful and goes to all our members. When this publication was issued our dues were increased from five to eight dollars. We have no admission fee. *Chemical Abstracts* has far exceeded our expectations in that it has been a journal approximately twice the size we had anticipated, and our membership has increased nearly one thousand in the last two years.

We have now adopted a new policy of organizing our society in divisions so that chemists interested in special lines may hold meetings together at the same time and place as our general meetings.

The number of industrial chemists is so great that we are now arranging to publish a third journal, *The Journal of Industrial and Engineering Chemistry*, and our dues have been raised from eight to ten dollars. To show how popular this last move was the letter ballot on this question brought out 1569 favorable votes to only 47 opposed.

We have now over 3800 members, and new members are coming in continually. We feel that the society has a very brilliant future.

I shall be glad to give you any further details that you may desire if you will indicate just what you wish.

I am, sincerely yours,

CHARLES L. PARSONS, Secretary.



SOCIETY ANNOUNCEMENTS

National Society Meetings.

National Dental Association, Birmingham, Ala., March 30, 31, April 2, 1909.

American Dental Society of Europe, Wiesbaden, Germany, April 9, 10, 12, 1909.

State Society Meetings.

Alabama Dental Association, Anniston, Ala., May 11, 1909.

Arkansas State Dental Association, Hot Springs, Ark., May 26, 27, 28, 1909.

Connecticut State Dental Society, Waterbury, Conn., April 20, 21, 1909.

Delaware State Dental Association, Wilmington, Del., February 3, 1909.

Florida State Dental Society, Ocala, Fla., June 17, 18, 19, 1909.

Iowa State Dental Society, Des Moines, Ia., May 4, 5, 6, 1909.

Indiana State Dental Association, Indianapolis, Ind., June 29, 30, July 1, 1909.

Louisiana State Dental Society, New Orleans, La., April, 1909.

Maine Dental Society, Portland, Me., June 24, 25, 26, 1909.

Nebraska State Dental Society, Lincoln, Neb., May 18, 19, 20, 1909.

New York State Dental Society, Albany, N. Y., May 8, 9, 1909.

Ohio State Dental Society, Columbus, O. December 7, 8, 9, 1909.

Oklahoma State Dental Society, Oklahoma City, Okla., June 3, 4, 5, 1909.

Utah State Dental Society, Logan, Utah, latter part of June or first part of July.

Vermont State Dental Society, Rutland, Vt., May 19, 20, 21, 1909.

West Virginia State Dental Society, Wheeling, W. Va., October 13, 14, 15, 1909.

Wisconsin State Dental Society, Milwaukee, Wis., July 13, 14, 15, 1909.



National Dental Association.

The thirteenth annual session of the National Dental Association will be held in Birmingham, Ala., March 30th and 31st, and April 1st and 2d next.

Dr. James McManus, of Hartford, Conn.; Dr. E. C. Kirk, of Philadelphia, Pa., and Dr. L. G. Noel, of Nashville, Tenn., will present essays at the general session.

The following partial programme of the sections is announced:

SECTION I.

Dr. Martin S. Dewey, of Kansas City, Mo., "The Development of the Face."

Dr. C. J. Grieves, of Baltimore, Md., "The Behavior of Certain Metals in the Mouth."

Dr. H. H. Johnson, of Macon, Ga., "Crown and Bridgework."

SECTION II.

Dr. Herbert L. Wheeler, of New York City, "Dental Education."

Dr. W. T. Jackson, of Cleveland, O., "The Elimination of Fear in the Practice of Dentistry."

Dr. J. R. Callahan, of Cincinnati, O., "Operative Dentistry."

Dr. S. D. Ruggles, of Portsmouth, O., "Nomenclature."

Dr. G. S. Vann, of Gadsden, Ala., "Dental Literature."

SECTION III.

Dr. A. H. Thompson, of Topeka, Kan., a paper on "Comparative Anatomy."

A complete list of the sections, with a full list of clinics, railway rates, etc., will be announced in the next issue of this journal.

All preparations for the meeting are well advanced and a large attendance is assured.

CHAS. S. BUTLER, Secretary.

American Dental Society of Europe.

The thirty-sixth annual meeting of the American Dental Society of Europe will be held in Wiesbaden, Germany, April 9, 10, 12, 1909. An interesting programme is already assured. A most cordial invitation is extended to members of the profession to be present.

T. G. PATTERSON, Hon. Secretary.

2 Quai des Eaux Vives, Geneva, Switzerland.



Complimentary Banquet to Dr. C. R. Butler.

The dental profession of Cleveland, Ohio, will give a complimentary dinner to one of its most honored members, Dr. C. R. Butler, on March 11, 1909, at 7 o'clock p. m., in commemoration of the completion of fifty-one years of dental practice by the doctor. This will be a democratic affair to which all ethical dentists are invited. The price per plate will be within the reach of all. Those desiring a place at the banquet will kindly notify the secretary at least ten days before.

DR. S. B. DEWEY, Secretary.

Lennox Building, Cleveland, Ohio.

University of Buffalo Dental Alumni Association.

The tenth annual meeting and clinic of the Alumni Association of the Dental Department of the University of Buffalo will be held on Friday and Saturday, February 19 and 20, 1909, in the Dental Building. An excellent programme is being prepared. All graduates and ethical practitioners are invited to attend and participate in the meeting.

HARRY F. TANNER, President.

ABRAM HOFFMAN, Ch. Executive Com.

GEORGE B. MITCHELL, Secretary.

483 Main Street, Buffalo, N. Y.

New Jersey State Board of Registration and Examination in Dentistry.

The New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination in the Assembly Chamber of the State House, Trenton, N. J., beginning Tuesday, July 6th, and continue through the 7th and 8th.

Practical examination held on the 6th, theoretical examination on 7th and 8th.

Practical work consists of soldering a gold or silver plate, one gold filling and one amalgam filling.

Gold filling must be an approximal with an approximating tooth in position.

Candidates requested to bring their patients.



Photograph and preliminary credentials must accompany the application.

Sessions begin promptly at 8 A. M. each day.

Applications must be in the hands of the secretary ten days prior to the examination.

CHARLES A. MEEKER, D.D.S.,
Secretary of Dental Commission.

29 Fulton Street, Newark, N. J.

First District Dental Society, State of Michigan.

The annual all-day clinic of the First District Dental Society, State of Michigan, will be held at Detroit on Saturday, February 13, 1909. For further particulars address

J. A. WALKER, Secretary.
284 Grand River Avenue, Detroit, Mich.

Minnesota State Board of Dental Examiners.

The next regular meeting of the board for the examination of applicants for license to practice dentistry in Minnesota will be held at the Dental Department of the State University in Minneapolis beginning on March 9, 1909, at 9 o'clock a. m.

All applications must be in the hands of the secretary by March 1, 1909. For further information address the secretary.

DR. GEO. S. TODD, Secretary.

Lake City, Minn.

15887

STATE OF MINNESOTA.

SUPREME COURT.
OCTOBER TERM, A. D. 1908.
No. 42.

STATE OF MINNESOTA, *Respondent*,

v.

ERNEST R. TAYLOR, *Appellant*.

A person who is licensed to practice medicine and surgery under the statute of the State, cannot by virtue thereof practice dentistry without securing a license as a dentist as required by ch. 117, G. L. 1907.

Order affirmed.

ELLIOTT, J.